

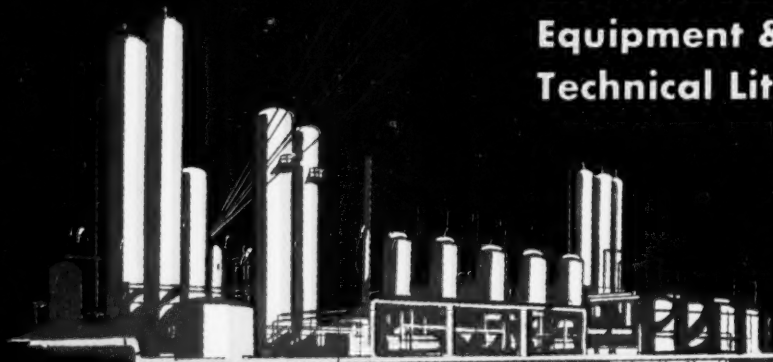
# *Chemical Engineering*

MID-SEPTEMBER 1954

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**NEW...**

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**Shell Chemical** is a convenient, dependable source for glycerine, *offering the highest purity product available.* Expanded facilities make Shell Chemical one of the nation's leading suppliers of glycerine... in any quantity from a drum to a tank car.

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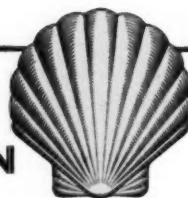
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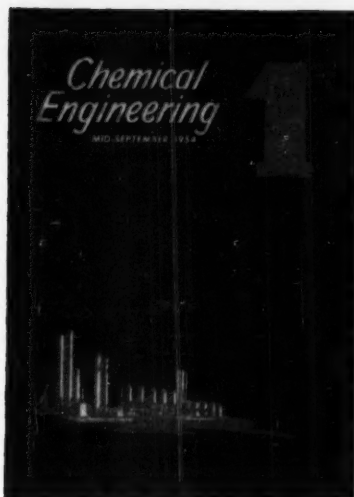
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## GUIDED TOUR

JOHN R. CALLANAM, EDITOR



### A New Reference Service

Here is CE's 1st Annual Inventory Issue, a special 13th issue to be published yearly, a new and timely—yet permanent—type of reference service for chemical engineers, an innovation in the entire chemical-publishing field.

For a year we've worked hard to make this a handy, easy-to-use reference. We developed a special format to make all material easy to find, easy to grasp, easy to follow up for more information.

All material, of course, has been digested to its factual core. And all listings have been carefully screened for their interest and value to the "practical" engineer in industry.

Most of our 38,500 subscribers should have many occasions to use this issue during the coming year. They will also find it a volume to be saved for future use as a permanent reference. For next year's Inventory Issue will supplement—but will not duplicate—the information in this issue.—JRC

### ... First Inventory Issue makes round-up of new developments for past year.

In some 215 pages, we present an inventory of important developments during the past fiscal year in new chemical plant construction, process and technology advances, new industrial chemicals and raw materials, new equipment, technical literature from manufacturers.

This special 13th issue—CE's 1st Annual Inventory Issue—is a timely, yet permanent, reference for chemical engineers.



### Who's building what, and where?

Our tally of new plants and facilities shows some 482 chemical construction projects announced, planned, under construction or completed during the past fiscal year. Here's the status of each (p. 44).

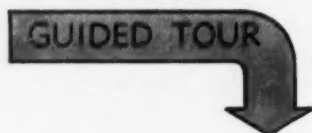


### What's new in processes, technology?

Plenty, for our inventory of new processes and technology advances comes up with 294 developments that have made news



*Please turn page*



within the past 18 months. Here's a pared-to-the-bone rundown on each (p. 66).



#### **New chemicals you should know about.**

Over 250 of them, in fact—all new or improved chemicals or raw materials carefully screened for their value to chemical engineers in industry. Want to know them better? CE's inventory makes it easy to get more information (p. 94).



#### **Can't keep up with new equipment?**

Most engineers find it tough, whatnot with all that's happening. Our inventory of new equipment developments of the past year brings you a terse digest of 571 developments—all organized for quick-as-a-trigger reference (p. 148).



#### **Building up your technical files?**

Want to build up your files and keep them up to date? Our comprehensive inventory of current technical literature will help you do just that. And they're all yours—free—for the asking (p. 256).

# *Chemical Engineering*

MID  
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## CHEMICAL ENGINEERING

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### What It Contains . . .

Here's a complete index to all chemicals, materials, equipment, services and literature advertised in this issue or mentioned editorially in the Chemical & Materials, Equipment & Accessories and Technical Literature inventory sections. It is, therefore, a master index to major developments in each of these areas during the past fiscal year ending July 1954.

### What the Code Means . . .

Each item has a code that is the key

to its location in this inventory issue. The numerals show the page where you'll find the item mentioned. The letters A, B, C and a, b, c identify different items on an editorial page or within an ad.

### For More Information . . .

You can get—and get fast—more information on any item in this master index by using the Reader Service postcards that follow the end of the index. Simply write in the item's code number on the card, then mail to us. Answers will come to you direct from

the manufacturer. Use the cards as often as you please during the coming year.

### This Section . . .

You'll find all items in the master index to this inventory issue arranged alphabetically and categorized, for your convenience, as follows:

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## Looking for Something?

Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and technology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information — fast — on products and services.

nology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information — fast — on products and services.

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### Ever use chemicals?

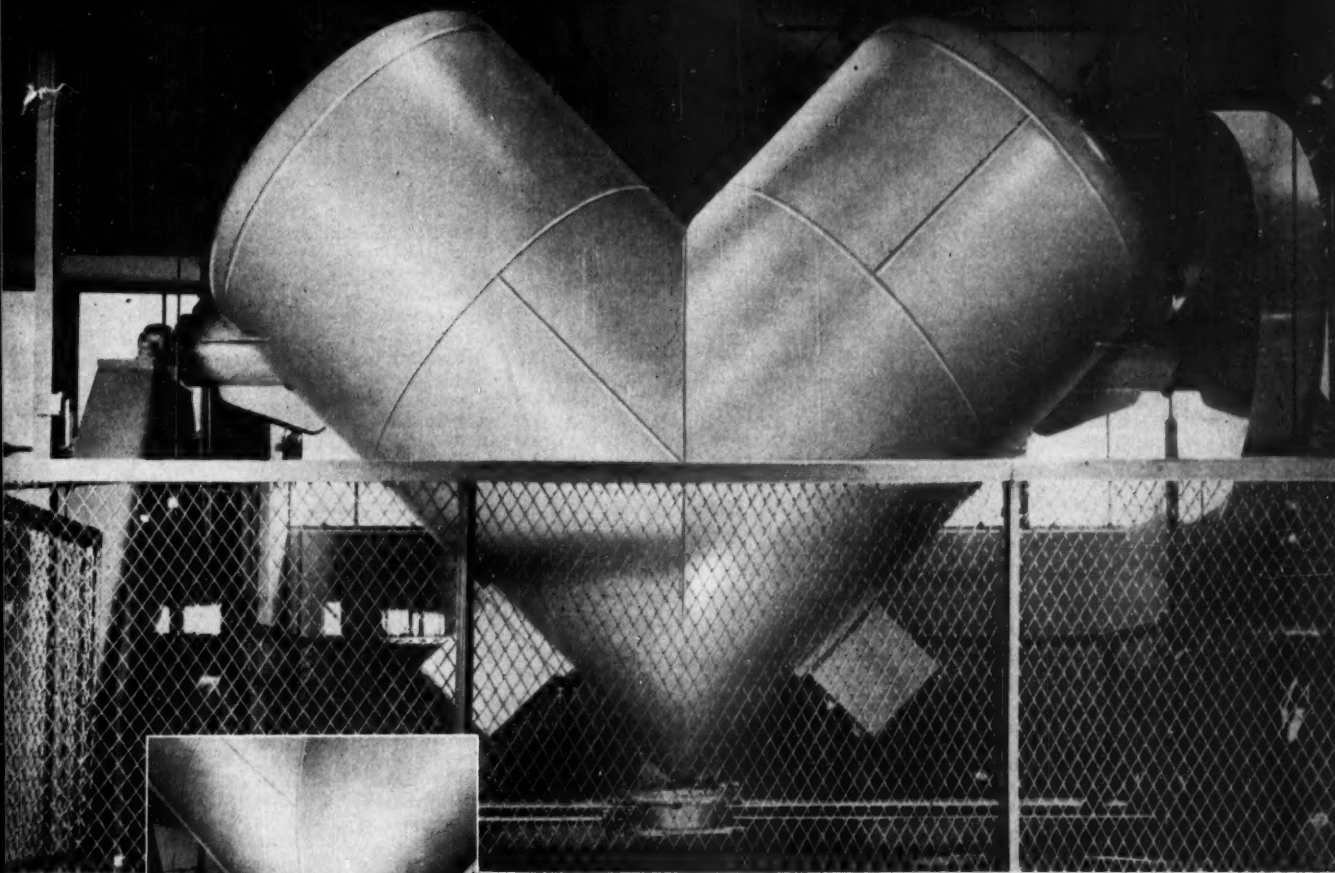
Of course you do — every chemical engineer does. So you'll want to take a hard look at our Inventory of New Chemicals & Materials in this issue. It's a handy rundown of major developments during the past twelve months. Nothing ever like it before (p. 94).



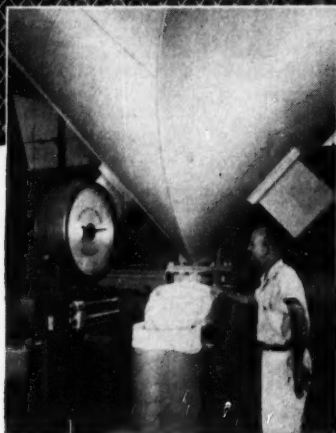


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## Looking for something?

You can bank on spotting it—and fast—in this Master Index to Chemicals & Equipment. You'll find it a unique fingertip reference to major developments within the past twelve months on new chemicals, materials, equipment, services and literature (refer to these pages):  
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→ Want more information  
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 one of the postcards that  
 follow this section, then  
 mail. It's easy, brings quick  
 answers.



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### Need some equipment?

Then you'll find this issue's Inventory of New Equipment right up your alley. It's a digest of the past year's major new developments in process equipment, the first complete round-up of its kind. You'll find it a handy tool for years to come (p. 148).





**Sinclair...**

**taking 7-league strides to pace  
the rise of petrochemicals**

No one knows better than Sinclair how fast America's chemical industry is growing. Since chemists first looked at a drop of oil, and decided to make something of it, the petroleum industry has been kept jumping to supply the growing demand for petrochemicals.

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**Sinclair Chemicals, Inc.**  
(Subsidiary of Sinclair Oil Corporation)  
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**Talk about yardsticks?** The CPI drinks up a quarter of all electricity sold by the utilities, pays the bill for close to half all manufacturing's power supply, generates more in its own plants than the rest of industry combined. What's more, consumption's set to double all over again in the next 10 years. The big load's still to come!

**Big load?** That's for sure! More power means automation, new plants, bigger capacities. More raw materials will be handled and processed . . . more conveyors and containers required. More equipment will be needed . . . mixers, motors, instruments, packaging machines . . . *more everything!* And the chemical engineer will keep stepping up demand to push a never-slacking flow of new products from lab to full-scale, low-cost production.

**See for yourself!** Take the market's pulse in the realistic pages of **CHEMICAL ENGINEERING**. Get an idea of the CPI's volatile potentials from its own workbook in . . . *Chemicals Buck The Trend — We'll Need 94% More Power By 1963 — How Much Money For New Facilities?* Then visualize what this constant current of technological activity can do to spark new opportunities for you.

**But don't stop here!** Use the market aids on the opposite page for a starter. Get hold of your CE representative . . . ask him to delineate the live-wire prospects for your product. Set your objectives high. And back your sales team with a solid schedule of low-cost, high-readership advertising . . . in the magazine more buying-powered production men prefer to any other . . . **CHEMICAL ENGINEERING**.

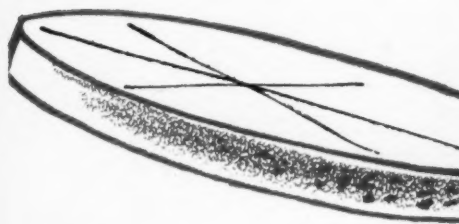


**CHEMICAL PROCESS INDUSTRIES**




# to the power-gulping CPI

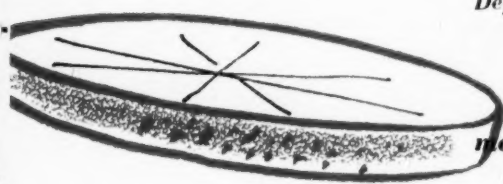
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## Chemical Engineering

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   Sheetings, rubber protective .....196E  
   Sheets  
     Galvanized .....316M

### Looking for something?

You can bank on spotting it—and fast—in this Master Index to Chemicals & Equipment. You'll find it a unique fingertip reference to major developments within the past twelve months on new chemicals, materials, equipment, services and literature (refer to these pages):

Chemicals & materials ..... 6  
 Equipment & accessories ..... 10  
 Services & processes ..... 34

- Sheets & plates, plastic .....196D  
 Shelters, loading dock .....347J  
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 Shovels, tractor-mounted .....209H  
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 Sifters .....287B, 287C  
   Gyratory circle .....91  
   Sigma formation .....316N  
 Silencers  
   Compressor .....248G  
   Intake-exhaust .....294CC  
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 Silicone rubber .....316O  
 Silicone rubber paste .....316P  
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   Oil drum tripod .....190H  
   Pouring .....210B  
 Starters .....330J

→ Want more information on any of these items? Just write its code number on one of the postcards that follow this section, then mail. It's easy, brings quick answers.



which  
impulse  
for you?



## STANDARD

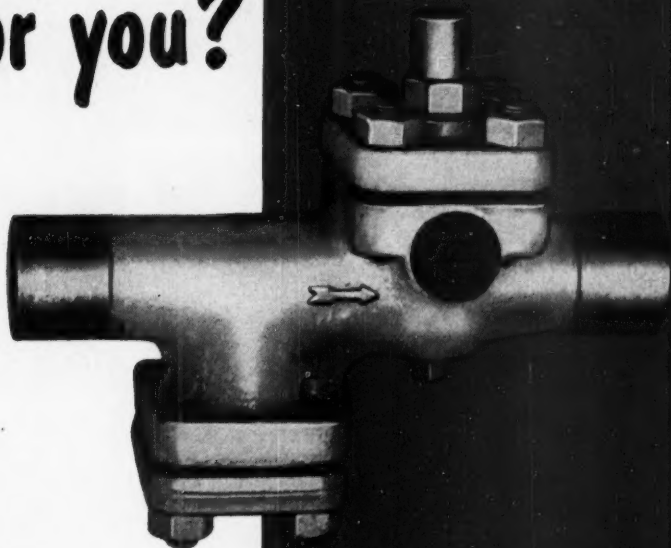
The standard YARWAY Impulse Steam Trap serves all normal trapping requirements. Factory set to operate without adjustment at all pressures from 20 psi to 400 psi (Series 60) and 600 psi (Series 120). For pressures below 20 psi, merely remove split washer.

*Numerous advantages like:*

- small size
- quick heating
- steady temperatures
- stainless steel construction
- one moving part
- non-freezing
- low cost

More than 900,000 used throughout industry.

Write for YARWAY Bulletin T-1740.



## HIGH PRESSURE, INTEGRAL STRAINER

YARWAY Integral Strainer High Pressure Impulse Steam Traps operate on some of the highest pressure steam lines in the country. Same operating principle as the standard YARWAY Impulse Trap. Strainer built into trap.

Ample capacity when system is being "warmed up"—yet will handle relatively small amounts of high temperature condensate without losing prime. Six sizes— $\frac{1}{2}$ " to 2". Pressures to 1500 psi (flanged ends) or 2500 psi (welding ends).

Write for YARWAY Bulletin T-1740.

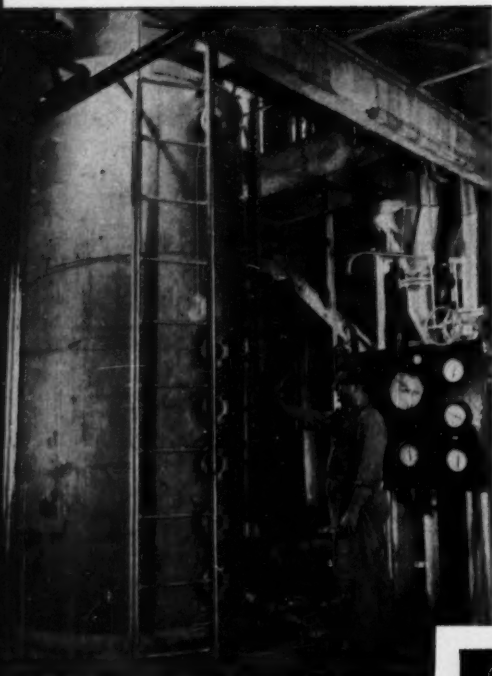
## YARNALL-WARING COMPANY

137 Marmal Avenue, Philadelphia 18, Pa.

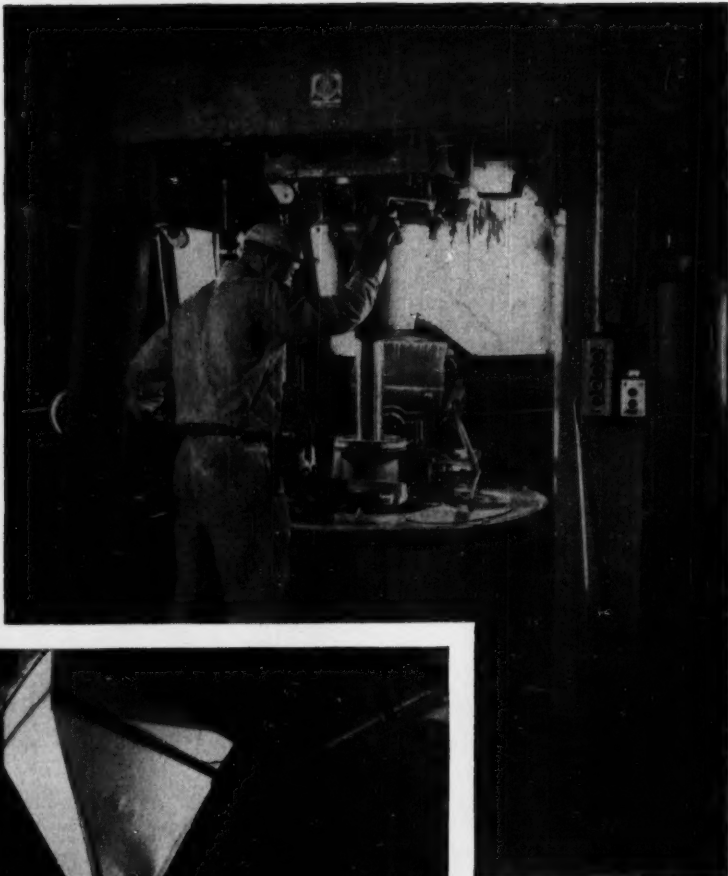
# impulse steam traps

YARWAY Impulse Steam Traps and Fine Screen Strainers are stocked and sold by more than 250 convenient local distributors. Write for name of one nearest you.

# Stainless Steel is **first** for all new equipment



**LIQUIDS** are drawn from Stainless Steel storage tanks into this single-effect Stainless Steel evaporator. Vapors condense in Stainless evaporator, a portion of which may be seen above and to the right of the operator.



**STAINLESS STEEL CENTRIFUGE** is being charged with slurry from a Stainless tank. Crystals are separated from the mother liquor here and plowed out of the centrifuge. The centrifuge was fabricated by the American Tool and Machine Company of Boston, Mass.

*Napco  
uses Stainless Steel  
for—*

Single-effect evaporator  
Condensers  
Storage tanks  
Centrifuges  
Turba-film® evaporators  
Ion exchange columns  
Reaction kettles  
Blow cases  
Extractions  
Trays  
Hoppers  
Comminutors



**DRIED CRYSTALS** enter this Stainless Steel comminuting machine through a Stainless steel hopper. Ground crystals are then packed for shipment. The comminuting machine was built by The W. J. Fitzpatrick Company, Chicago.

# choice among metals in this plant in the last 10 years

• The Fine Chemicals Division of Nopco Chemical Company, Inc., Harrison, N. J. has found Stainless Steel equipment to be a highly satisfactory answer to many of the problems encountered in its processing operations.

Purity is a watchword at Nopco—a producer of ingredients for pharmaceutical products. This requires complete freedom from contamination due to corrosion, and Stainless Steel's superior corrosion resistance meets this requirement fully.

Stainless Steel's bright, smooth surface also aids greatly in maintaining cleanliness. Foreign matter that

might go unobserved on a darker, duller surface is easy to detect—and is easily removed.

Stainless Steel fills Nopco's needs so well that Louis T. Rosenberg, Production Manager of the Fine Chemicals Division, points out, "There has not been a major piece of equipment installed in this depart-

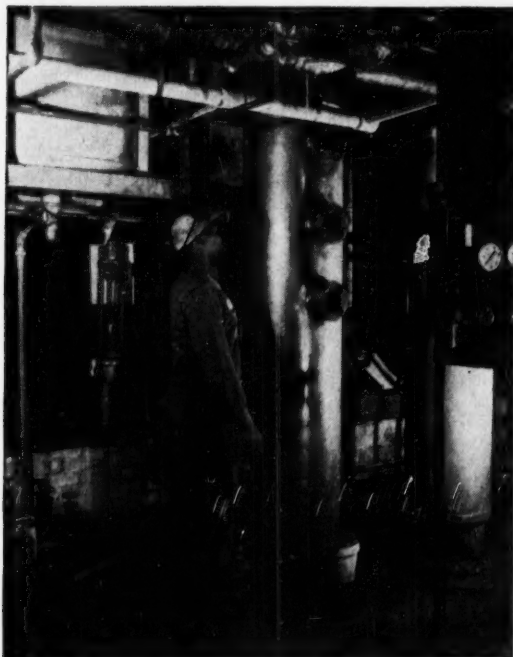
ment during the past 10 years that has not been constructed of either Stainless Steel or glass."

The benefits of Stainless Steel can play an important part in improving the efficiency of your processing line. And, wherever you use it, be sure it is perfected, service-tested USS Stainless Steel.

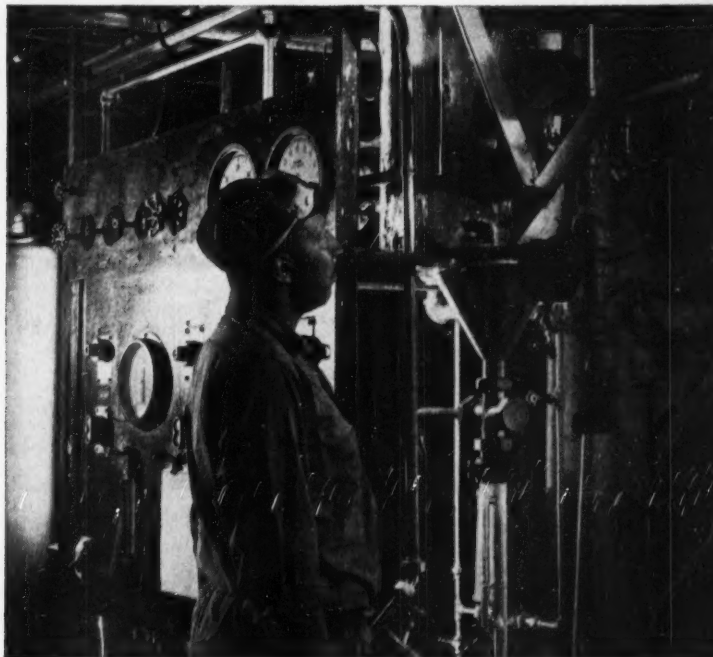
UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND  
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH  
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.  
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

## USS STAINLESS STEEL

4-1416  
SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS



TWO STAINLESS STEEL ion exchange columns are used for purification of various organic solutions. They were designed and built by The Permutit Company, New York City.



A STAINLESS STEEL TURBA-FILM EVAPORATOR, built by Rodney Hunt Machine Co., Orange, Mass., is used for concentrating heat sensitive liquids.



UNITED STATES STEEL



- Motor ..... 330K, 330L  
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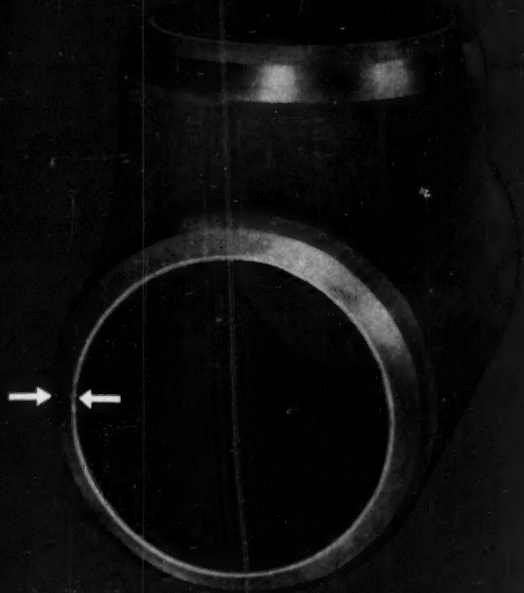
→ Want more information on any of these items? Just write its code number on one of the postcards that follow this section, then mail. It's easy, brings quick answers.

### Ever use chemicals?

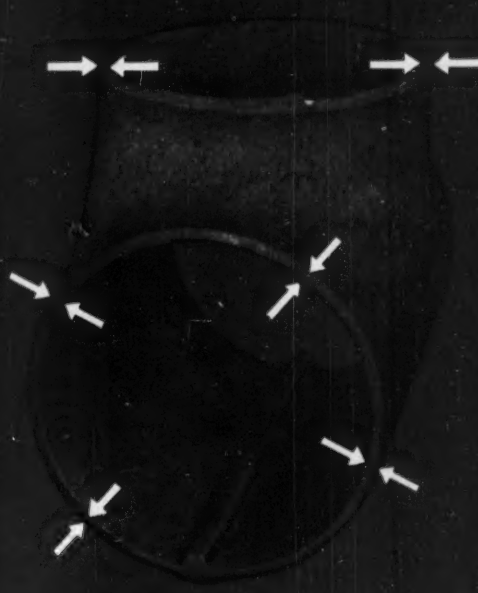
Of course you do — every chemical engineer does. So you'll want to take a hard look at our **Inventory of New Chemicals & Materials** in this issue. It's a handy rundown of major developments during the past twelve months. Nothing ever like it before (p. 94).

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# EVIDENCE OF SUPERIORITY IN *Corrosive Service*



**BEFORE** *Midwest Tee was heavy weight carbon steel and showing original wall thickness of heavy right before it was accidentally subjected to corrosive conditions.*



**AFTER** *When straight pipe in line had failed from corrosion, this Midwest Tee was removed. Note amount and uniformity of wall thickness remaining.*

A valve leaked or somebody opened it by mistake . . . so the Midwest Tee shown above was subjected to dilute hydrofluoric acid in addition to its normal service in a 300° F. hydrocarbon line on an alkylation unit.

The highly corrosive acid caused failure of the straight pipe . . . so the entire line had to be replaced. When cut out of the line, the Midwest Tee was found to have a considerable (and uniform) wall thickness. There was no selective corrosion and the weld held up even better than the parent metal.

This was not special alloy made to resist corrosion, but regular Grade "A" carbon steel . . . the same as the new tee shown left above. We do not, of course, recommend carbon steel for corrosive conditions,

but, in emergency, it gives good account of itself.

The exclusive Midwest manufacturing process produces fittings of superior metallurgical properties. The metal is worked in compression . . . it is not stretched or extruded, and distribution is uniform. After forming and welding, the fitting is stress-relieved. For further information, write us for a copy of Catalog 54.

## MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second Street, St. Louis 4, Mo.

Plants: St. Louis, Passaic, Los Angeles and Boston

Sales Offices: New York 7—50 Church St. • Chicago 3—79 West Monroe St.

Los Angeles 33—520 Anderson St. • Houston 2—1213 Capitol Ave.

Tulsa 3—224 Wright Bldg. • Boston 27—426 First St.

Cleveland 14—616 St. Clair Ave.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

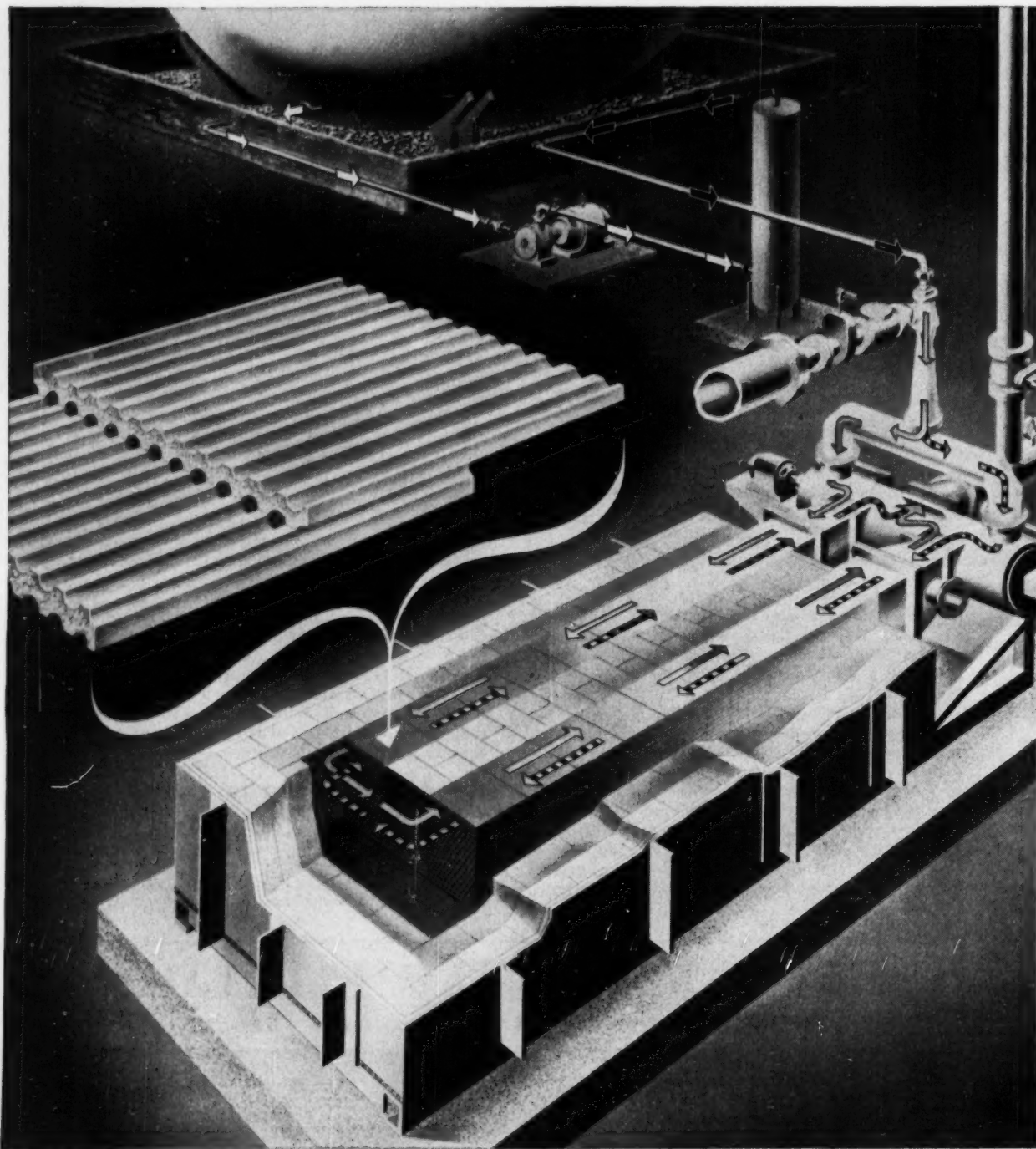
# MIDWEST WELDING FITTINGS

IMPROVE DESIGN AND REDUCE COSTS

# ANNOUNCING

## Another Koppers product and service

---





# to the chemical and petroleum industries

## THE KOPPERS-HASCHE REFORMER

**Now**—the newest Koppers development for the chemical and petroleum industries—the Koppers-Hasche Reformer. Based on a unique adaptation of the cyclic heat-regenerative principle, its engineering features and operation are indicated in the accompanying diagram. Modifications of this process are utilized for production of low-molecular weight olefins from low-molecular paraffins. Your reforming job is done economically, too, because a Koppers-Hasche is inexpensive to install and operate.

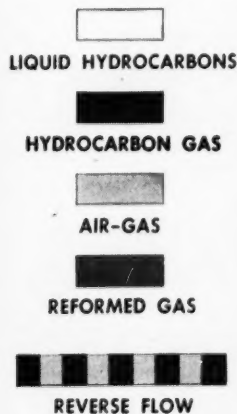
Applications of this unit are many—we'd be glad to have an opportunity to tell you about them. Or, write for our new booklet "The Koppers-Hasche Reformer," which fully describes its operation, when producing heating gas. Just send us the handy coupon below.

Over a period of many years, Koppers has designed and built many successful chemical plants. If your future plant is in the test tube, pilot plant or design stage, our experience in design, engineering and construction is as near as your telephone.

### KOPPERS COMPANY, INC.

*Engineering and Construction Division*  
*Chemical and Gas Department*  
Pittsburgh 19, Pennsylvania

#### Flow diagram



Koppers Company, Inc.  
Engineering and Construction Division  
Chemical & Gas Dept.  
Pittsburgh 19, Pennsylvania

Please send me, without charge or obligation, a copy of your new booklet on the Koppers-Hasche Reformer.

Name.....  
Address.....  
City..... Zone..... State.....

**Can't remember?**

Can't quite recall who built that new plant, who developed that new process? Well, then, take a crack at finding the answer in this issue's Inventory of New Plants & Facilities (p. 44) or Inventory of New Processes & Technology (p. 66). They're designed to help you.

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Bulk	213E
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→ Want more information on any of these items? Just write its code number on one of the postcards that follow this section, then mail. It's easy, brings quick answers.

Nickel iron	324Q
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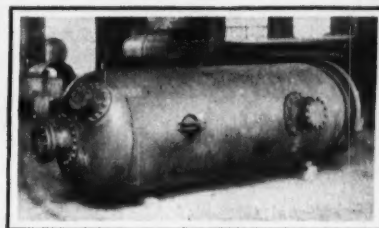
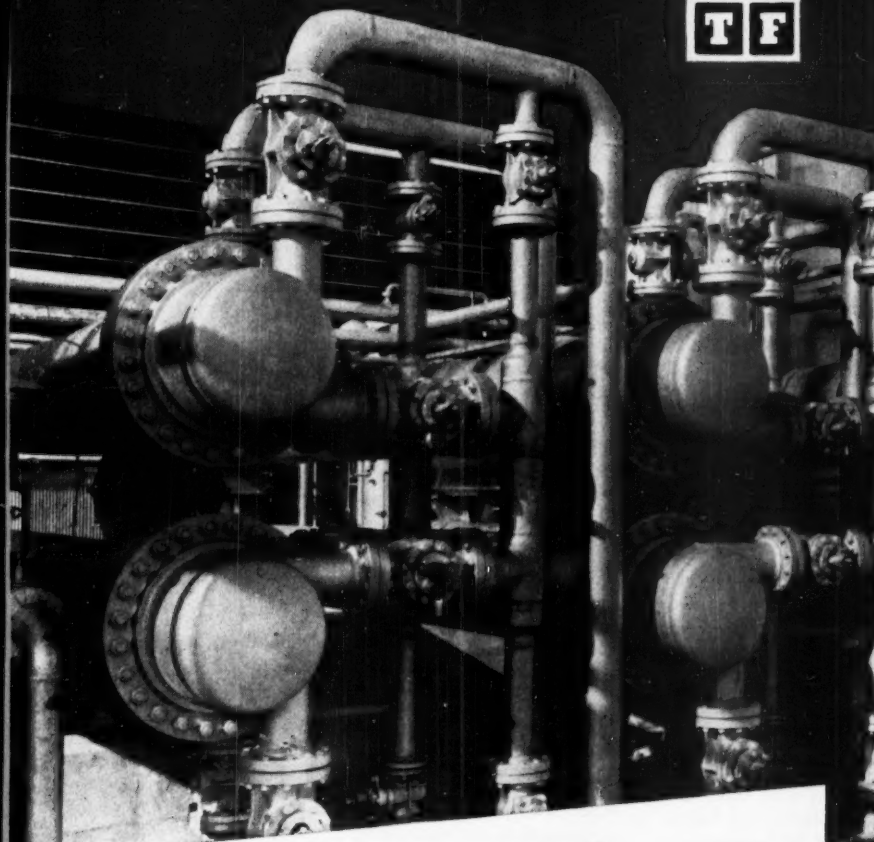
## Looking for Something?

Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and tech-

nology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information — fast — on products and services.

## Contents of This Inventory Issue . . .

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New Plants & Facilities	44	Technical Literature Now Available	256
New Processes & Technology	66	Reader Service Cards —	
New Chemicals & Materials	94	For More Information	35



## A New Development that's 37 Years Old

When you cut a hole in the shell of a pressure vessel you of course weaken it. But, how much?...or, to put it another way, how much reinforcement is necessary to make the shell surrounding an opening as strong as any other part of the shell?

In the old days of low pressure and over-sizing that hadn't been much of a problem. But when pressures began to climb fast (about 1915) it became a tough one.

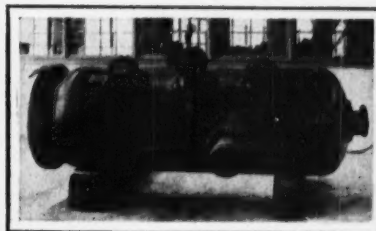
Taylor Forge had already begun to relish problems like this: had pioneered the forged steel flange; was playing a major part in the development of flange and piping standards. So it isn't at all surprising that Taylor Forge again came forward with the solution — the first seamless forged steel pressure vessel nozzles.

The research and testing that Taylor Forge put into designed pressure vessel outlets dates back to the riveted, sweep nozzles that are still giving safe, satisfactory service. But as riveting gave ground to welding, still more critical analyses were made to determine the exact requirements of nozzles designed for welding.

These many years of tests and studies were fully summed up in a paper entitled "Effects of Openings in Pressure Vessels" which was presented by the late J. Hall Taylor and Professor E. O. Waters at the June 1933 meeting of the ASME. It is still authoritative in this field.

Yes, a new idea that is 37 years old! So thoroughgoing was its first development—so critical the steps taken to maintain its leadership—that today Taylor Forge Seamless Nozzles and Welding Necks are the standards of the entire pressure vessel and piping industry.

**An episode in the story of  
Taylor Forge leadership in designed piping**



# Taylor Forge all the way

Throughout the power and process industries you will see hundreds of model installations like this where someone who wanted to be sure has specified Taylor Forge all the way through...WeldELLS,<sup>®</sup> flanges, welding necks, nozzles.

Whatever your needs—simple or complex—it will pay you to *use* all the way through, the products that have *led* all the way through.

See your Taylor Forge Distributor for up-to-the-minute facts.

## TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS • General Offices and Works:  
P.O. Box 485, Chicago 90, Illinois • Offices in all principal cities  
Plants at: Carnegie, Pa.; Fontana, Calif.; Gary, Ind.; Hamilton, Ontario, Canada





# Service dictionary for **ALCOA**

Because of its long service life and low initial cost, ALCOA Aluminum has become one of the most popular metals in the chemical industries. Perhaps this service dictionary will help show why . . . and suggest some uses that can mean less down time, improved operations and greater savings in *your* business.

## **Acetic and other Aliphatic Acids**

ALCOA Aluminum used in equipment producing glacial acetic acid has a service record as long as 17 years. Propionic and butyric acids as well as several of the higher molecular weight acids (fatty acids) also are processed, stored, and shipped in aluminum equipment.

## **Air and Gas Coolers**

Aluminum heat exchanger tubes have been used successfully in air compressor intercoolers and aftercoolers. In one specific intercooler installation, aluminum tubes are still in service after more than 16 years with no significant corrosion being apparent. Alcoa Aluminum tubes are considered ideal for intercoolers handling natural gas, hydrogen sulfide, carbon dioxide, and many other gases.

## **Ammonia**

ALCOA Aluminum heat exchanger tubes have given up to 15 years continuous service handling mixtures of ammonia gas, carbon dioxide, and water vapor in soda ash plants. More than 12 years of service have been experienced in the use of aluminum tubes in ammonia dephlegmators and condensers. Aluminum storage tanks, piping, and bubble cap towers for ammonia recovery are now in service.

## **Ammonium Nitrate**

Ammonium nitrate and its aqueous solutions are handled extensively in aluminum. Aluminum evaporators, crystallizers, condensers,

screens, piping, pumps, tankage, and prilling towers are in use. Aluminum pressure vessels, piping, and tank cars are also used to handle ammonium nitrate fertilizer solutions.

## **Food and Drug Processing**

ALCOA Aluminum has been used in these processes for over 30 years. Nontoxic to living organisms, aluminum successfully handles Chloromycetin, citric acid, gluconic acid, oxogluconic acid, calcium gluconate, dextro-lactic acid, Penicillin, Streptomycin, sorbose, and riboflavin.

## **Formaldehyde**

Several ALCOA Aluminum condenser installations with excellent service records (some as long as 12 years) are in operation handling formaldehyde. Aluminum distillation towers, storage tanks, piping, heat exchangers, shipping drums, and tank cars also are in this service.

## **Hydrocyanic Acid**

Aluminum process equipment for handling hydrocyanic acid includes distillation towers, absorption towers, heat exchangers, condensers, tankage, piping, and shipping drums.

## **Naval Stores**

Naval stores—turpentine, rosin, copal, pentene, dipentene, and pinene—are widely handled in aluminum equipment. Aluminum resin kettles, evaporators, condensers, storage tanks,

# ALUMINUM in the chemical industries

transfer lines, distillation equipment, piping, and shipping drums have been in service for over 20 years.

## Oxygen

Aluminum is one of the most economical materials of construction for tonnage oxygen plants. Its mechanical properties increase substantially with decreasing temperature with no loss in ductility. Among its applications in this field are low pressure fractionating towers, trays and bubble caps, reboilers, acetylene separators, piping, conventional heat exchangers, and unique gas-to-gas reversing exchangers with very high transfer characteristics.

## Petroleum Products

Aluminum storage tank roofs for sour crude oils have been in service for more than 20 years in locations where steel roofs failed in less than 5 years. ALCOA Aluminum heat exchanger tubes have been used for more than 18 years handling sour gasoline stocks. Aluminum bubble cap towers have given service of 10-15 years in debutanizer columns handling gasoline distillate from West Texas sour crudes at 200-425°F. Aluminum's low cost coupled with its remarkable resistance to corrosion by sulfur compounds has established its use in this industry.

## Refrigeration

In addition to the inorganic refrigerants,

ammonia and sulfur dioxide, several halogenated organic compounds are used in aluminum refrigeration equipment. Of these, the Freons have proved very satisfactory for use in aluminum.

## Soaps & Cosmetics

For nearly 25 years ALCOA Aluminum has been in continuous service handling fatty acids in storage tanks, condensers, piping, and tank cars. Aluminum protects the stability and color of essential oils, edible oils and fats and glycerine . . . effecting trouble-free service and yielding a higher quality product.

## Solvents & Oils

Oils from animal and vegetable sources have negligible action on aluminum. Thus, lard oil, castor oil, cottonseed oil, peanut oil, olive oil, and palm oil are processed in aluminum. Aluminum piping, tubing, and process equipment are also used to handle solvents such as naphtha, benzene, diethyl ether, and others.

## Sulphur

One important factor favoring aluminum's use in the chemical and petroleum industries is its high resistance to corrosion by sulphur and sulphur compounds, notably hydrogen sulfide, one of the greatest sources of corrosion in the petroleum field. Sulphur vats, forms, piping, conveyors, hopper cars, and structures of ALCOA Aluminum are used to handle the elemental sulphur.

## Helpful ALCOA Booklets

Call your nearest Alcoa sales office or write for any of these free booklets:

*Alcoa Aluminum in the Process Industries*  
*Alcoa Aluminum Heat Exchanger Tubes*  
*Alcoa Aluminum Pipe and Fittings*  
*Alcoa Utilitube*

ALUMINUM COMPANY OF AMERICA, 903 Alcoa Building, Pittsburgh 19, Pa.

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ALUMINUM COMPANY OF AMERICA

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 Y ..... 217b  
 Valves & controls ..... 322HH  
 Valves & pressure switches ..... 325B  
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# What's New in Gaulin Homogenizing

**LATEX THREAD** — Gaulins make it smoother, more uniform...improve dip and extrusion characteristics.

**LIQUID STARCH** — A Gaulin improves transparency, clarity and stops separation at a cost far below conventional methods.

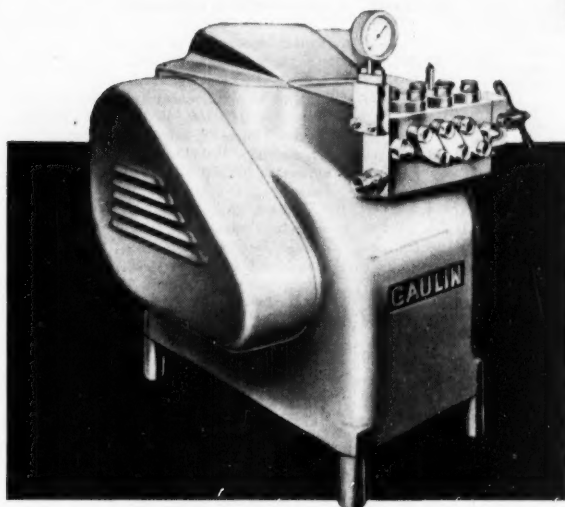
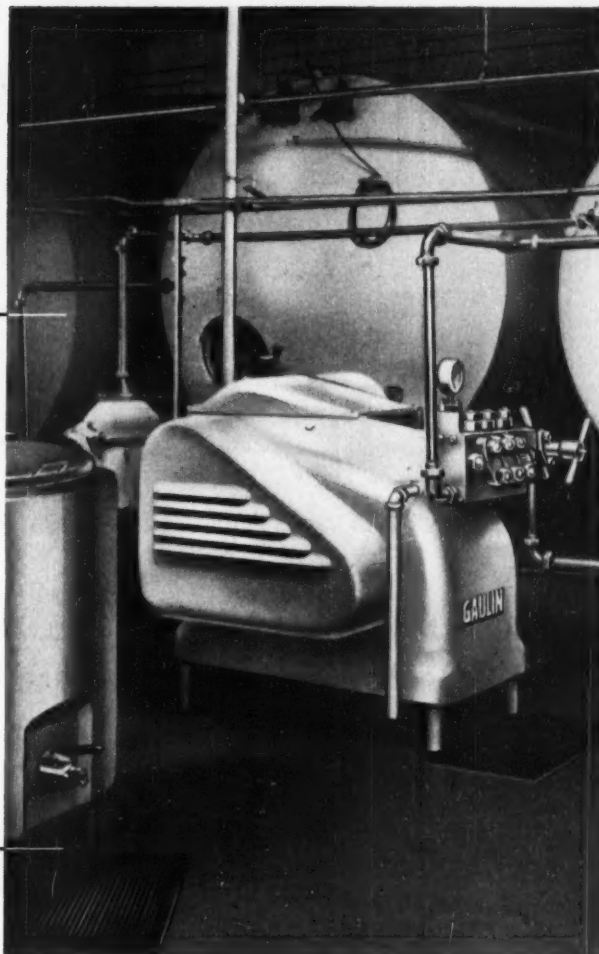
**GREASE** — Improves lubricating value and stability. Increases service life.

**ESSENTIAL OIL EMULSIONS** and Spiced Flavors have controlled uniformity plus added taste because maximum surface area is obtained from each particle.

**COSMETIC EMULSION** — Gaulins give it a smoother texture, longer shelf-life. Perfume is locked-in against evaporation.

**WAXES** — Provides more uniform, stable emulsions and convenient viscosity control.

**SEND FOR BULLETIN I-53** on how Gaulin Homogenizers can work for you.



## What's New in High Pressure Pumping

Gaulin Triplex, Stainless-Steel, High Pressure Pumps are cutting operating costs in a wide variety of applications. In moving viscous materials...in handling highly corrosive or abrasive materials...in spray drying...in transfer applications...in metering... Gaulins provide *more capacity*, with *less maintenance* on your part. For full facts write for Bulletin I-53.



**GAULIN PILOT PLANT  
HOMOGENIZER**

Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.



**GAULIN TWO-STAGE  
COLLOID MILL**

Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045"; three models up to 600 GPH capacity. Only seconds clean-up required in changing colors. 12" head room. 12" x 17" floor area.



**Manton-Gaulin**  
MANUFACTURING COMPANY, INC.

71 GARDEN STREET, EVERETT 49, MASS.

World's largest manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills

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## This Section . . .

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## Inventory of New Plants and Facilities . . .

. . . A comprehensive rundown, organized for fast reference, of 482 major new U. S. chemical projects during the past year.

## AGRICULTURAL CHEMICALS

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Agriform .....	Pasco, Wash. ....	Liquid fertilizer .....		Project under way during '54.
Alabama By-Products .....	Tarrant, Ala. ....	Ammonia .....	\$6,000,000	Certificate of necessity granted.
Allied Chemical & Dye (Nitrogen) ..	Hopewell, Va. ....	Nitro-phosphate fertilizer .....	7,000,000	Certificate of necessity granted.
Allied Chemical & Dye (Nitrogen) ..	Hopewell, Va. ....	Ammonia .....	8,000,000	Production to be increased by 50,000 tons per year to 326,000 tons per year (as nitrogen) making it largest installation in country.
Allied Chemical & Dye (Nitrogen) ..	La Platte, Neb. ....	Ammonia, urea, nitrophosphates .....	25,000,000	In production. 75,000 tons per year anhydrous ammonia, 200,000 tons per year nitrophosphates.
Allied Chemical & Dye (Nitrogen) ..	South Point, Ohio. ....	Urea .....	4,000,000	Urea capacity doubled late '53.
American Cyanamid .....	Mid-West .....	Ammonia .....	8,000,000	Certificate of necessity denied.
American Cyanamid .....	Fortier, La. ....	Ammonia, acetylene, sulfuric acid, HCN, ammonium sulfate, acrylonitrile, oxygen. ....	50,000,000	Scheduled for completion soon. Sulfuric acid oxygen and sulfate on stream. 100,000,000 pounds per year acrylonitrile. 300 tons per day ammonia.
Arizona Gas & Chemical .....	Northern Arizona .....	Ammonia, helium .....	3,000,000	Development of nitrogen and helium wells planned. Conversion of nitrogen to ammonia.
Armour & Co. ....	Levi, Tenn. ....	Mixed fertilizers .....	500,000	In operation.
Armour & Co. ....	Bartow, Fla. ....	Triple superphosphate .....		Doubling capacity to 80,000 tons per year.
Associated Coop. ....	Muscle Shoals, Ala. ....	Nitrophosphates .....	2,000,000	60 tons nitric acid per day, 60,000 tons fertilizer a year.
Atlantic Refining .....	Philadelphia, Pa. ....	Ammonia .....		100 tons per day. Byproduct hydrogen from cat-former.
Atlas Powder .....	Atlas, Mo. ....	Ammonia .....	7,000,000	Certificate of necessity granted.
Bluegrass Plant Foods .....	Cynthiana, Ky. ....	Fertilizer .....	250,000	Project under way during '54.
Brea Chemicals .....	Brea, Calif. ....	Ammonia .....	13,000,000	In operation. 235 tons per day. To be expanded to 300 tons per day by late '54.
Brea Chemicals .....	Brea, Calif. ....	Ammonium nitrate and nitric acid .....	12,500,000	Contract awarded for engineering work.
Carstens Packing .....	Tacoma, Wash. ....	Fertilizer .....	175,000	20,000 tons per year.
Celanese .....	Baton Rouge, La. ....	Ammonia .....	10,000,000	Conducting surveys. 150,000-200,000 tons per year. Certificate of necessity denied.
Columbia River Chemicals .....	Pasco, Wash. ....	Ammonia, urea, ammonium sulfate .....	11,500,000	Contract awarded for design and construction. Operate late '55. Produce 160 tons per day anhydrous ammonia, 110 tons per day urea, 140 tons per day ammonium sulfate. Will use oil for hydrogen production. New ammonia synthesis by L'Air Liquide.



## What It Contains...

This is CE's fifth annual inventory of major new plants and facilities in the chemical process industries. This issue includes 482 important new plants or facilities announced, planned, under construction or completed in the U.S. during the last half of 1953 or the first half of 1954. We have tried to make this inventory accurate for major projects; we have made no attempt to include all minor projects nor those costing less than \$100,000. We list "planned" projects although some of these may never materialize.

## For Other Listings...

This listing covers only the twelve-month period from July 1953 through June 1954. For projects not included in this period, consult the New Plants & Facilities tabulations initiated by CE in 1951 and published annually since that year in these issues: February 1951, 1952 and 1953, January 1954. These five annual surveys have listed a total of some 2,800 new construction projects in the U.S. chemical process industries. Our next or 1955 annual Inventory Issue will list new projects for the coming twelve months.

### AGRICULTURAL CHEMICALS (Continued)

FIRM	LOCATION	PRODUCTS	DOLLARS	JOB STATUS & REMARKS
Columbia-Southern Chemical.....	Natrum, W. Va.....	Ammonia.....	19,000,000	Production scheduled for late '54. Will use hydrogen from electrolysis plant formerly burned as fuel. New producer.
Commercial Solvents.....	Sterlington, La.....	Ammonia, methanol, ammonium nitrate, nitrogen solutions	20,000,000	Expansion completed. Doubled capacity for ammonia, methanol. Additional ammonia capacity: 190 tons per day.
Cooperative Farm Chemicals.....	Lawrence, Kan.....	Ammonia, ammonium nitrate, nitrogen solutions	15,000,000	Scheduled to operate by Jan. '55. 83,000 tons per year ammonium nitrate, 13,200 anhydrous ammonia, 13,200 of 40% nitrate solutions.
Darling & Co.....	Chicago, Ill.....	Mixed fertilizers.....		Boost in capacity from 42,000 to 50,000 tons per year.
Davison.....	Bartow, Fla.....	Triple superphosphate, sulfuric acid	12,000,000	200,000 tons per year. In production April '54. Dorr process.
Davison.....	New Albany, Ind.....	Granulated mixed fertilizer..	1,000,000	New facilities in operation.
John Deere.....	Pryor, Okla.....	Ammonia, urea.....	20,000,000	On stream. 180 tons per day ammonia. Urea plant to operate by fall '54.
Diamond Alkali.....	Deer Park, Tex.....	Ammonia.....	5,600,000	Certificate of necessity denied.
Dow.....	Freeport, Tex.....	Ammonia.....	3,600,000	Expansion underway. To double capacity.
Farm Bureau Service.....	Kalamazoo, Mich.....	Granulated fertilizer.....		30,000 tons per year.
Federal Chemical.....	Butler, Ind.....	Fertilizer.....		Doubling size. Start Jan. '54.
Filtrol.....	Vernon, Calif.....	Ammonium sulfate.....	5,000,000	Underway.
Food Machinery & Chemical (Westvaco).....	S. Charleston, W. Va.....	Ammonia.....	Multi-million	60 tons per day anhydrous. Underway.
Gates Brothers.....	Montpelier, Idaho.....	Phosphatic fertilizers.....	2,000,000	Certificate of necessity granted.
Grace Chemical.....	Woodstock, Tenn.....	Ammonia, urea.....	20,000,000	250 tons per day ammonia, 150 tons per day urea expected to be produced by Sept. '54.
Gulf Improvement.....	Pascagoula, Miss.....	Nitrophosphates.....	15,000,000	Project underway during '54.
Hercules Powder & Alabama By-Products.....	Birmingham, Ala.....	Ammonia.....		Under construction. To complete '55. 45,000 tons per year anhydrous ammonia.
Hercules.....	Louisiana, Mo.....	Ammonia.....	3,600,000	Picked up gov't. option. Scheduled to reach 42,000 tons per year rate by Sept. '54.
Hooker Electrochemical.....	Tacoma, Wash.....	Ammonia.....		Added 20 tons per day to capacity. Byproduct hydrogen from chlorine cells.
Illinois Farm Supply.....	Tuscola, Ill.....	Mixed fertilizers.....		Under construction. To operate Jan. '55. 50,000 tons per year.
International Minerals & Chemical.....	Bonnie, Fla.....	Superphosphates, dicalcium phosphate	14,000,000	100,000 tons per year dicalcium phosphate. In operation. Undergoing changes to make possible production of triple superphosphate (25,000 tons per year).
International Minerals & Chemical.....	Carlsbad, N. M.....	Potassium sulfate.....		Expanding to increase output by 35,000 tons per year. Project expected to be completed in '54.
International Minerals & Chemical.....	Clarksville, Tenn.....	Plant food mix.....	500,000	20,000 tons per year. In operation May '54.
International Minerals & Chemical.....	Somerset, Ky.....	Fertilizer.....		Double size. Construction on project started July '53.
International Minerals & Chemical.....	Tuscola, Ill.....	Nitrophosphate fertilizer.....	10,500,000	Certificate of necessity granted.
Jefferson Chemical.....	Port Neches, Tex.....	Ammonia.....	8,000,000	Certificate of necessity denied.
Lange Brothers.....	Audrain County, Mo.....	Nitrophosphate fertilizer.....	8,000,000	Certificate of necessity granted.
Lion Oil.....	Luling, La.....	Ammonia, ammonium nitrate, nitric acid, dry ice, liquid carbon dioxide	31,000,000	On stream May '54. 550 tons per day pelleted ammonium nitrate, 450 tons per day ammonia.

## AGRICULTURAL CHEMICALS (Continued)

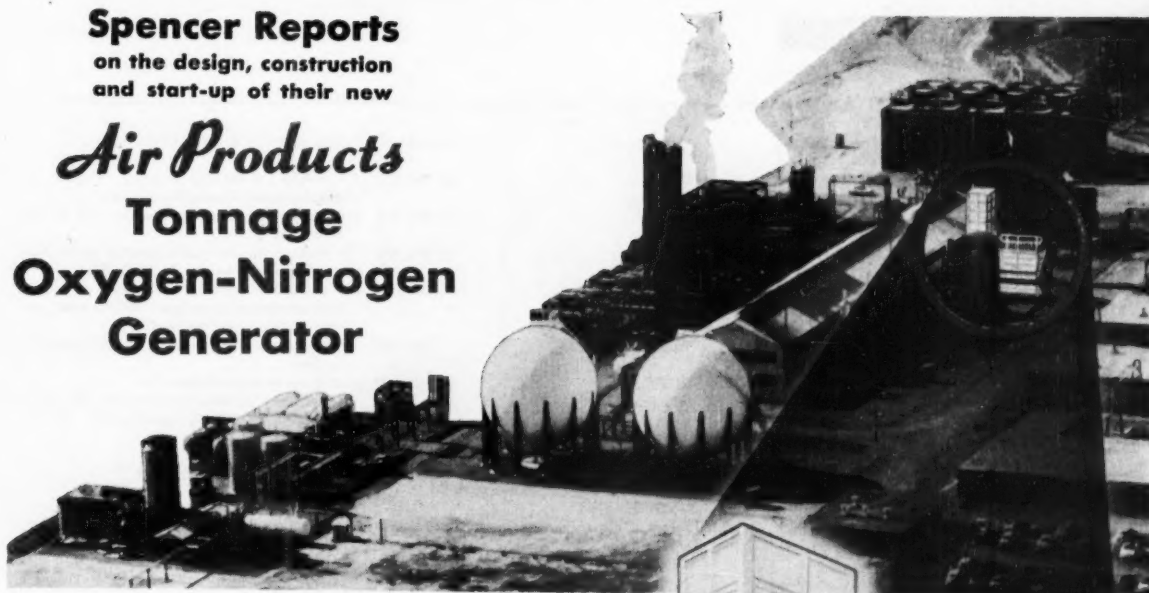
* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Matheson	Pasadena, Tex.	Phosphate fertilizers	1,500,000	Expansion completed. Increased capacity by 25%.
Merck	Albany, Ga.	Ammonia	14,000,000	Certificate of necessity denied.
Midland Ammonia		Ammonia		Certificate of necessity denied a second time.
Mississippi Chemical	Yazoo City, Miss.	Ammonia, ammonium nitrate	5,000,000	Expanding towards 290 tons per day ammonia in '55.
Mississippi River Fuel	Crystal City, Mo.	Ammonia, ammonium nitrate	15,000,000	Construction contract awarded. 100 tons per day anhydrous ammonia. Complete late '55.
Missouri Farmers Assn.	Joplin, Mo.	Mixed fertilizer, triple superphosphate	3,500,000	Construction began mid '53. Phosphoric acid capacity: 75 tons per day. 70,000 tons per year mixed fertilizers.
Monsanto	St. Louis, Mo.	Dicalcium phosphate		Production started late '53.
Monsanto	Texas City, Tex.	Nitrogen products	16,800,000	Certificate of necessity granted.
National Farmers Union	Carlsbad, N. M.	Potash	12-14,000,000	Mine sites being established.
National Farmers Union	Canon City, Colo.	Triple superphosphate	6,000,000	Under consideration.
National Petrochemical	Tuscola, Ill.	Ammonia, nitrogen compounds	7,000,000	Scheduled for production Jan. '55. 50,000 tons per year anhydrous ammonia. Nitrogen by air fractionation. Hydrogen from ethylene unit.
Northern Chemical Industries	Sandy Point, Me.	Ammonia, nitric acid, nitrophosphate	14,000,000	150 tons per day ammonia. Certificate of necessity granted.
Pennsalt	Calvert City, Ky.	Benzene hexachloride	2,000,000	New continuous process.
Phillips Chemical	Pasadena, Tex.	Ammonia	29,000,000	In operation. 450 tons per day. From natural gas.
Phillips Chemical	Pasadena, Tex.	Triple superphosphate, ammonium sulfate	4,500,000	Expansions completed to 435 tons per day triple, 1,000 tons per day sulfate.
Pittsburgh Agricultural Chemical	Neville Island, Pa.	CIPC herbicide		New plant underway.
E. Raub & Sons	Tuscola, Ill.	Nitrophosphate fertilizers	2,000,000	Certificate of necessity granted.
Rohm & Haas	Deer Park, Tex.	Ammonium sulfate	1,300,000	Certificate of necessity granted.
F. S. Royster Guano	Mulberry, Fla.	Triple superphosphate	3,000,000	70,000 tons per year. Certificate of necessity granted.
Salt Lake Chemical	Salt Lake City, Utah	Ammonia, dry ice	7,800,000	To complete third quarter '55. 120 tons per day ammonia, 30 tons per day dry ice. From natural gas.
San Jacinto Chemical	Houston, Tex.	Ammonia	1,600,000	40 ton per day expansion completed early '54.
Shell Chemical	Ventura, Calif.	Ammonia	10,000,000	150 tons per day anhydrous ammonia. In production late '53.
C. O. Smith Fertilizer	Douglas, Ga.	Fertilizer		Project underway during '54.
Spencer Chemical	Vicksburg, Miss.	Anhydrous ammonia, nitric acid, ammonium nitrate, nitrogen solutions	15,000,000	On stream '54. Partial oxidation of methane. 210 tons per day ammonia, 100 tons per day nitric acid.
Spencer Chemical	Henderson, Ky.	Nitric acid, nitrogen solutions	1,750,000	Planned.
Summers Fertilizer	Sioux Falls, S. D.	Fertilizers		On stream. 40,000 tons per year.
Standard Oil (Ind.)	Whiting, Ind.	Ammonia	10,000,000	Certificate of necessity denied.
Standard Oil (Ohio)	Lima, Ohio	Ammonia	18,000,000	Certificate of necessity denied.
Stauffer Chemical	Tacoma, Wash.	Pelletized fertilizer		Project underway during '54.
Swift	Florida	Triple superphosphate		Doubling capacity to 150,000 tons per year.
Texas City Chemicals	Texas City, Tex.	Dicalcium phosphate	6,000,000	In production late '53. Wet process. 56,000 tons per year.
Tri-State Chemical	Henderson, Ky.	Fertilizer		In operation. 20,000 tons per year.
Tri-State Chemical	Springdale, Ark.	Mixed fertilizer	180,000	Underway.
Union Carbide (Carbide & Carbon)	Institute, W. Va.	Allethrin		Underway, 500,000 pounds per year
United Chemical	Timpson, Tex.	Ammonia, urea	18,000,000	Scheduled for completion late '55. 250 tons per day ammonia, 90 tons per day urea. Financing not yet completed.
Utah Chemical	Southeastern Utah	Ammonia, nitric acid, ammonium nitrate	18,750,000	To produce 278 tons per day ammonia. From natural gas. Certificate of necessity requires start of construction by early '55.
Western Phosphate	Garfield, Utah	Triple superphosphate, phosphoric acid, ammonium phosphate	5,000,000	On stream early '54. 90,000 tons per year.

## METALS AND ALLOYS

Aero Metals	Boulder City, Nev.	Titanium	1,000,000	Planned.
Alcoa	Rockdale, Tex.	Aluminum		Third and fourth potlines onstream late '53. Capacity all four; 170,000,000 pounds per year.
Alleghany-Ludlum		Zirconium		Expansion underway. Strip and other shapes for atomic energy applications.
Carborundum Metals	Akron, N. Y.	Zirconium, hafnium	2,500,000	150,000 pounds per year both metals.
Climax Molybdenum	Climax, Colo.	New metals and alloys	35,000,000	Expansion completed.
Cramet (Gov't contract)	Chattanooga, Tenn.	Titanium, rare earths	25,000,000	Scheduled to be in partial production early '55. Will increase domestic production of titanium sponge by 6,000 tons per year.
Dow	Freeport, Tex.	Magnesium		Underway. Will add 2.5 million pounds per year to Dow's production at Freeport. From cell sludge.
Dow		Titanium		Will boost production from 600 to 10,000 pounds per day 2 years hence.

**Spencer Reports**  
on the design, construction  
and start-up of their new

# *Air Products* **Tonnage Oxygen-Nitrogen Generator**



• Spencer Chemical Company's New Ammonia Plant at Vicksburg, Miss.

*Spencer Chemical Company*  
Dwight Building  
Kansas City 5, Missouri

Mr. Leonard Pool, President  
Air Products, Incorporated  
P. O. Box 538  
Allentown, Pennsylvania

Dear Mr. Pool:

"...I want to express for the entire Spencer Company our appreciation for the strong team of technical men that you have sent down to assist with the erection of the Air Plant and put it through its initial paces. They are not only technical experts, but have exhibited a fine attitude towards working together with our men."

"...It is particularly gratifying to us to see that the expanders and liquid oxygen pumps are both performing excellently."

Very truly yours,

*R. F. Brown*

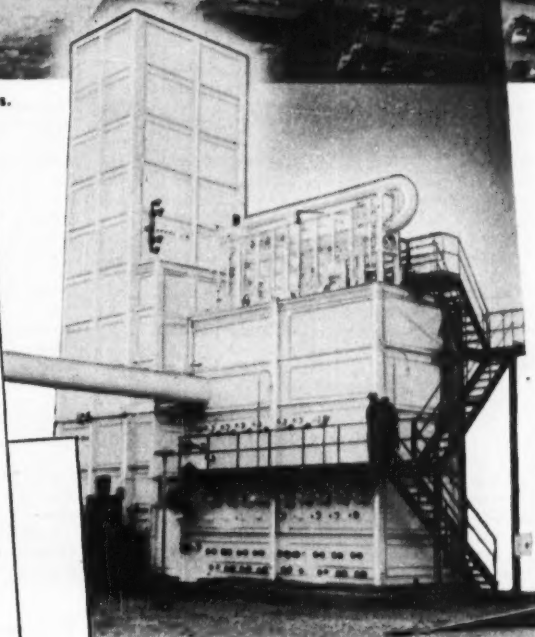
R. F. Brown  
General Works Manager

"...I should like again to compliment you and your organization on the fine manner in which you cooperated with all of our Spencer people during the construction and start-up of the Vicksburg Unit. To my knowledge, it was a relationship which left little or nothing to be desired."

Very truly yours,

*B. M. Kern*

B. M. Kern  
Chief Engineer



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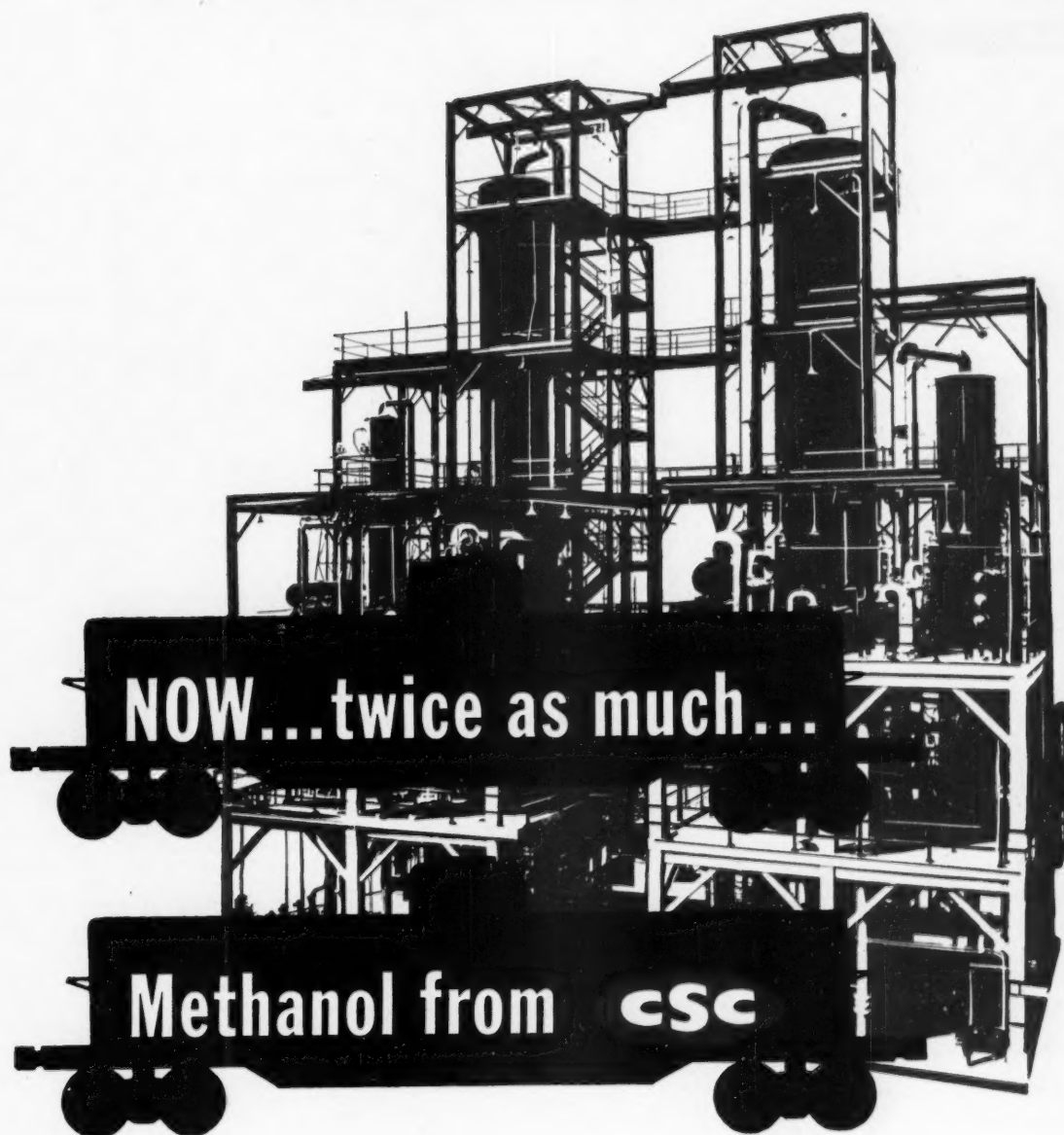
**METALS AND ALLOYS (Continued)**

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Du Pont (Gov't. contract).....	Waverly, Tenn.....	Titanium.....	35,000,000	To produce 7-8,000 tons per year. Major expansion scheduled complete.
Du Pont.....	Newport, Del.....	Titanium.....		
General Electric (Gov't. contract).....	Hanford, Wash.....	Plutonium.....	40,000,000	Expansion of chemical processing unit to be completed in '55.
Hanna Nickel Smelting.....	Riddle, Ore.....	Ferro-nickel.....	22,000,000	To produce 95-125 million pounds nickel per year in form of ferronickel (25% Ni).
Harvey Aluminum.....	The Dalles, Ore.....	Aluminum.....	35,000,000	Plans dormant pending clarification of power and aluminum situations. 54,000 tons per year in new reduction plant.
Horizons Titanium.....	Stamford, Conn.....	Titanium.....	600,000	Tentative site for pilot plant. Electrolytic process.
International Nickel.....	Huntington, W. Va.....	Nickel.....	425,000	Certificate of necessity granted.
Kaiser Aluminum & Chemical.....	Chalmette, La.....	Aluminum.....		Last of eight potlines onstream late '53. Full capacity: 400,000,000 pounds per year of aluminum.
Manganese Chemicals...*	Riverton, Minn.....	Manganese.....		Semi-works plant onstream late '54.
Metal Hydrides.....	Devers, Mass.....	Hydrides, metal powders, alloy powders.....		Planned.
National Metallurgical.....	Springfield, Ore.....	Silicon, silicon-aluminum alloys.....	2,500,000	In production of elemental silicon Jan. '54. To produce 100 tons per month silicon-aluminum alloys soon.
Nicaro Nickel.....	Moa Bay, Cuba & New Orleans, La.....	Nickel.....	35,000,000	Planned expansion. Subsidiary of Freeport Sulphur.
Olin Industries.....		Aluminum.....	170,000,000	Planned. 110,000 tons per year.
Pacific Northwest Alloys.....	Spokane, Wash.....	Ferrochrome.....		Production started late '53. 1,500,000 pounds per month.
Reade Mfg.....	Lakehurst, N. J.....	Magnesium chips and powder.....		Will double output to 200,000 pounds per month.
Rem-Cru Titanium.....	Midland, Pa.....	Titanium.....		Tripling output from 3 to 10 ingot—tons per day.
Reynolds Metals.....	Gum Springs, Ark.....	Aluminum.....	34,000,000	New reduction plant on stream early '54.
Reynolds Metals.....	Sheffield, Ala.....	Aluminum.....	2,500,000	Expansion and modernization underway.
Titanium Metals.....	Henderson, Nev.....	Titanium.....		Expansion towards goal of 10 tons per day.
Union Carbide (Gov't. contract).....	Paducah, Ky.....	Uranium 235.....	1,000,000,000	First unit in operation; second under construction.
Union Carbide (Electromet).....	Marietta, Ohio.....	Electrolytic chromium.....		On stream early '54.
Union Carbide (Electromet).....	Ashtabula, Ohio.....	Titanium.....	30,000,000	10,000 tons per year sponge. Will build.
Union Carbide (Electromet).....	Ashtabula, Ohio.....	Ferroalloys and calcium carbide.....	29,000,000	Expansion program. First furnaces started up Work on six others underway.
Wheland.....	Chattanooga area, Tenn.....	Aluminum.....	70,000,000	Planned. 50,000 tons per year reduction plant.

**PETROLEUM & NATURAL GAS PRODUCTS**

Amerada Petroleum.....	Williston Basin, N. D....	Natural gasoline.....	\$10,000,000	Planning.
American Oil.....	Texas City, Tex.....	Alkylate.....		Capacity doubled.
Anderson-Prichard Oil.....	Cyril, Okla.....	Motor gasoline, aromatics, hydrogen.....		Under construction. Catalytic reforming unit.
Barnhart Hydrocarbon.....	Big Lake, Tex.....	Natural gas products.....	700,000	Certificate of necessity granted.
Bay Petroleum.....	Denver, Colo.....	Cracked petroleum.....		Fluid catalytic cracker on stream late '53. Increases refinery capacity to 11,000 bbl. crude oil per day.
Bay Refining.....	Saginaw, Mich.....	Hi-octane gasoline.....	3,000,000	Under construction. Packaged Thermoform catalytic cracking unit, capacity 6,000 bbl. per day. Catalytic polymerization unit, capacity 300 bbl. per day. Project due complete fall '54.
Carter Oil.....	Billings, Mont.....	Refined petroleum.....		New fluid coking unit scheduled for completion by Oct. '54.
Cities Service.....	Lake Charles, La.....	Alkylate.....		Expanding facilities. Full capacity: 17,250 bbl. per day.
Cities Service.....	E. Chicago, Ill.....	Petroleum products.....	6,000,000	Topping unit (30,000 bbl. per day) and fluid hydroformer (12,780 bbl. per day) under construction. Due complete fall '54.
Columbian Carbon.....	St. Mary Parish, La.....	Carbon black.....	3,000,000	Scheduled to operate Nov. '54. 60 million pounds per year.
Continental Blacks.....	Ponca City, Okla.....	High-abrasion carbon black.....	2,750,000	40 million pounds per year. In production May '54.
Continental Oil.....	Ponca City, Okla.....	Petroleum products.....	7,500,000	Expansion due complete by fall '54.
Continental Oil.....	Gilba, La.....	Natural gasoline.....	1,500,000	Expansion completed. Processing capacity increased from 27 to 90 million cubic ft. per day gas.
Crown Central Petroleum.....	Pasadena, Tex.....	Refined petroleum.....	1,000,000	Adding 5,000 bbl. per day capacity. Completion due Oct. '54.
Eso Standard Oil.....	Baltimore, Md.....	Processed naphthas and heating compounds.....	3,500,000	Construction planned. Hydrofiner: 12,000 bbl. per day straight run naphthas, 5,000 bbl. per day heavy heating oil, 3,000 bbl. per day heavy naphtha hydroformer feed. Hydroformer: 3,000 bbl. per day upgraded naphthas.
Eso Standard Oil.....	Everett, Mass.....	Gasoline, heating oils, kerosene, asphalt.....		Completed late '53. Catalytic cracker and other facilities. Raises total output of plant to 2,000,000 gallons per day of all products.





Giant, new production facilities are now in full operation at our Sterlington Plant in Louisiana. Basic in methanol for a number of years, CSC can now supply twice as much as it formerly did.

Pioneer in high-pressure synthesis, CSC is ready to serve all American Industry with high-quality synthetic methanol, minimum purity 99.85%, in tank cars, tank trucks, barges, tankers, drums.

Bulk distribution has been expanded to give fast delivery to the Midwest and eastern seaboard. Tank and barge service points have been enlarged and increased in number. Bulk terminal facilities are now maintained at Carteret, N. J., Camden, N. J., New Haven, Conn., New Orleans, La., Chicago, Ill.

## COMMERCIAL SOLVENTS

260 MADISON AVENUE

NEW YORK, N. Y.



INDUSTRIAL  
CHEMICALS

## PETROLEUM AND NATURAL GAS PRODUCTS (Continued)

FIRM	LOCATION	PRODUCTS	DOLLARS	JOB STATUS & REMARKS
General Petroleum.....	Ferndale, Wash.....	Refined petroleum.....	35,000,000	35,000 bbl. per day refinery. Sovaforming unit (6-8,000 bbl. per day). Due complete by fall '54.
General Petroleum.....	Torrance, Calif.....	Petroleum products.....	10,000,000	New Thermofor catalytic reformer. 19,000 bbl. per day. Due complete fall '54.
Great Northern Oil.....	St. Paul, Minn.....	Refined petroleum.....	26,000,000	Planned. Crude topping unit, cat cracker, cat reformer, cat polymerisation unit.
Gulf Oil.....	Cincinnati, Ohio.....	Refined petroleum.....		Platformer under construction. 10,000 bbl. per day.
Gulf Oil.....	Port Arthur, Tex.....	Gasoline.....	8,000,000	Under construction. Ready early '55. New catalytic reforming unit. To double plant's output of aviation gasoline. Capacity of unit: 29,000 bbl. per day.
Gulf Oil.....	Philadelphia, Pa.....	Refined petroleum.....	50,000,000	Expansion completed May '54. Includes world's largest fluid cat cracker with fresh feed capacity of 63,000 bbl. per day.
Gulf Refining.....	St. Landry Parish, La.....	Liquefied petroleum gases.....	10,000,000	Under construction. To produce per year: 11,000,000 bbl. propane, 10,000,000 bbl. butane, 6,500,000 bbl. condensate.
Humble Oil & Refining.....	Baytown, Tex.....	Refined petroleum.....	6,500,000	Pipe still (crude) underway.
Humble Oil & Refining.....	Baytown, Tex.....	Refined petroleum.....	5,400,000	Cat polymerization unit due to be completed Sept. '54.
Magnolia Petroleum.....	Beaumont, Tex.....	Reformed petroleum.....	10,000,000	Cat reformer due complete late '54.
National Petrochemical.....	Tuscola, Ill.....	Propane, butane, natural gasoline		400,000 gpd. butane, 80,000 gpd. propane, 19,000 gpd. natural gasoline.
Pacific Oil & Refining.....	Tacoma, Wash.....	Refined petroleum.....	5,000,000	Scheduled for completion fall '54.
Pan American Refining.....	Yorktown, Va.....	Refined petroleum.....		Contract awarded. 35,000 gal. per day.
Pan American Refining.....	Texas City, Tex.....	Refined petroleum.....	8,500,000	Catalytic cracker completed late '53. 9,000 bbl. per day of high-octane blending stock.
Phillips Chemical.....	Borger, Tex.....	Carbon black.....	2,000,000	Certificate of necessity granted.
Prime Oil.....	Calumet City, Ill.....	Refined petroleum.....	10,000,000	Planned. 15,000 bbl. per day.
Proven Oil & Refining.....	Florence, Ariz.....	Refined petroleum.....	18,300,000	Refinery (15,000 bbl. per day) due to be complete in '55.
Pure Oil.....	Heath, Ohio.....	Catalytic reforming.....	2,000,000	3,000 bbl. naphthas per day from 33 to 98 octane. Kellogg process using regenerative platinum catalyst. Underway.
Quaker State Oil Refining.....	Emlenton, Pa.....	Gasoline.....		Construction planned. 850 bbl. per day.
Quaker State Oil Refining.....	St. Marys, W. Va.....	Gasoline.....		Construction planned. 850 bbl. per day.
Richfield Oil.....	Watson, Calif.....	Petroleum products.....	43,000,000	Expansion due complete '54. Cat cracker (20,000 bbl. per day), aromatics.
Shell Oil.....	Anacortes, Wash.....	Refined petroleum.....	75,000,000	Contract let Oct. '53. In partial operation mid '55. 50,000 bbl. per day refinery. Crude oil fractionating unit, platformer, cat cracker.
Shell Oil.....	Brea, Calif.....	Natural gasoline.....	630,000	Certificate of necessity granted.
Shell Oil.....	Martinez, Calif.....	Reformed petroleum.....	2,300,000	4,500 bbl. per day unit. Shell's third platformer. In operation June '54.
Shell Oil.....	Noroo, La.....	Cracked petroleum.....	42,000,000	Scheduled for completion fall '54. Cat cracker. 72,000 bbl. per day.
Shell Oil.....	Wood River, Ill.....	Reformed petroleum.....		Platforming unit under construction. Due complete late '54.
Signal Oil & Gas.....	Fox, Okla.....	Natural gasoline.....	\$3,000,000	Certificates of necessity granted.
Signal Oil & Gas.....	Tioga, N. D.....	Natural gasoline.....	9,500,000	Under construction.
Sinclair Refining.....	E. Chicago, Ind.....	Refined petroleum.....		Will build cat reformer. 16,000 bbl. per day. New platinum catalyst to be used.
Sinclair Refining.....	Marcus Hook, Pa.....	Refined petroleum.....	14,000,000	16,000 bbl. per day. Underway.
Socony-Vacuum Oil.....	Augusta, Kan.....	Reformed petroleum.....		Under construction. 3,000 bbl. per day Sovaforming unit.
Socony-Vacuum Oil, et al.....	Manderson, Wyo.....	Gas products.....	15,000,000	Gas processing plant due complete Nov. '54.
Standard Oil (Calif.).....	Richmond & El Segundo, Calif.....	Refined petroleum.....	30,000,000	Refinery expansion. Two large cat reformers. Scheduled to operate spring '55.
Standard Oil (Ind.).....	Wood River, Ill.....	Reformed petroleum.....		Ultraforming unit. 8,000 bbl. per day. Due complete late '54.
Standard Oil (Ind.).....	Whiting, Ind.....	Reformed petroleum.....		Fluid cat hydroformer. 27,000 bbl. per day. Due complete early '55.
Standard Oil (Ind.).....	El Dorado, Ark.....	Reformed petroleum.....		Construction planned. Ultraforming units. 6,000 bbl. per day.
Standard Oil (Ind.).....	Casper, Wyo.....	Reformed petroleum.....		Ultraforming unit. 3,750 bbl. per day. Due complete early '55.
Standard Oil (Ind.).....	Casper, Wyo.....	Petroleum alkylate.....		New 700 bbl. per day alkylation unit. Underway.
Standard Oil (Ind.).....	Sugar Creek, Mo.....	Reformed petroleum.....		Fluid cat hydroformer. 12,000 bbl. per day.
Standard Oil (Ind.).....	Texas City, Tex.....	Reformed petroleum.....		Fluid cat hydroformer. 21,000 bbl. per day.
Standard Oil (Ind.).....	Whiting, Ind.....	Detergent alkylate.....		In production late '53. Uses benzene and propylene tetramer.
Standard Oil (Ind.).....	Mandan, N. D.....	Refined petroleum.....	23,000,000	Scheduled to operate late '54. Capacity of new refinery: 30,000 bbl. per day.
Standard Oil (Ohio).....	Lima, Ohio.....	Refined petroleum.....	11,500,000	Catalytic reformer. 462,000 gallons per day. Also tankage, etc. Underway.
Stanolind Oil & Gas.....	Brownsville, Tex.....	Synthesis gas products.....		Taking over Carthage Hydrocol plant, idle since June '53. \$17,500,000 loan from R.F.C. Operation many months away. 300,000 pound per day.

## PETROLEUM AND NATURAL GAS PRODUCTS (Continued)

• FIRM	• LOCATION	• PRODUCTS	• DOLLARS	• JOB STATUS & REMARKS
Sun Oil.....	Marcus Hook, Pa.....	Petroleum aromatics.....	15,000,000	In production late '53. 19,000,000 gallons per year benzene, 19,000,000 gallons per year toluene, 15,000,000 gallons per year mixed xylenes.
Sun Oil.....	Marcus Hook, Pa.....	Refined petroleum.....		Under construction. Houdrifiow cat cracker—27,000 bbl. per day. Houdriformer—18,000 bbl. per day. Scheduled for completion by April '55.
Sun Oil.....	Toledo, Ohio.....	Reformed petroleum.....	7,200,000	Completing construction as of April '54. Cat reforming unit. 10,000 bbl. per day.
Sun Oil.....	Toledo, Ohio.....	Refined petroleum.....		Contract let for new Houdrifiow cat cracker. Will process 27,000 bbl. per day crude oil. Scheduled to operate early '55.
Sunray Oil.....	Duncan, Okla.....	Petroleum reforming.....	1,000,000	Platformer under construction. Due in late '54. To produce high-grade blending agent for upgrading motor gasolines.
Suntide Refining.....	Corpus Christi, Tex.....	Petroleum products.....	14,000,000	In operation. 30,000 bbl. crude topping unit, vacuum unit, and 15,000 bbl. per day cat cracker.
Sunray Oil.....	Duncan, Okla.....	Petroleum coke.....	4,000,000	Scheduled for completion late '54.
Texas Co.....	Port Arthur, Tex; Westville, N. J.; Wilmington, Calif; Lockport, Ill.; Lawrenceville, Ill; West Tulsa, Okla.; El Paso & Amarillo, Tex.	Refined petroleum.....		Expansion and modernization planned. Six new platformers with combined capacity of 75,000 bbl. per operating day, three alkylation units, hydrotreater, isomerization unit. Substantial part of \$275 million.
Tidewater Associated Oil.....	Avon, Calif.....	Petroleum alkylate.....		Extensive improvements to gas processing facilities and alkylation plant completed late '53.
Tidewater Associated Oil.....	West Coast.....	Refined petroleum.....		Platformer under construction.
Union Oil.....	Oleum, Calif.....	Refined petroleum.....	14,900,000	Unifining unit, platformer. Due complete early '55.
Washington Processing.....	Tacoma, Wash.....	Refined petroleum.....	10,000,000	25,000 bbl. per day. Underway.
Wood River Oil and Refining.....	Calumet City, Ill.....	Refined petroleum.....	10,000,000	Planned. 15,000 bbl. per day.

## POLYMERIC MATERIALS

Allied Chemical & Dye (National Aniline)	Hopewell, Va.....	Nylon-6.....	\$23,000,000	Under construction. Capacity: 20,000,000 pounds per year. Scheduled to start production late Nov. '54.
Allied Chemical & Dye (Semet Solvay)	Tonawanda, N. Y.....	Polyethylene.....	10,000,000	Plant in operation Jan. '54. Capacity: 20 million pounds per year.
American Enka.....	Enka, N. C.....	Nylon.....		Now producing staple fiber. Construction of additional facilities well underway. To produce filament yarn by end of '54.
American Enka.....	Lowland, Tenn.....	Viscose rayon yarn.....	4,000,000	Expansion underway.

## Looking for Something?

Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and tech-

nology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information — fast — on products and services.

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**POLYMERIC MATERIALS (Continued)**

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Whitney Blake	Hamden, Conn.	Compounded rubber	800,000	Planned.
Catalin	Calumet City, Ill.	Polystyrene molding powder		Under construction.
Chemstrand	Pensacola, Fla.	Nylon yarn		In operation. To reach full capacity (50 million pounds per year) by early '55.
Dow	Fresport, Tex.	Polyethylene	11,000,000	Scheduled to operate summer '55. To produce 25 million pounds per year.
Dow	Midland, Mich.	Styrene-butadiene latex		25% expansion on stream late '53. Total capacity now close to 45,000,000 pounds latex per year.
Dow	Torrance, Calif.	Polystyrene		In operation late '53.
Dow-Corning	Midland, Mich.	Silicone rubber	1,500,000	Increased capacity to 500,000 pounds per month.
Du Pont	Circleville, Ohio	Polyester film	10,000,000	Due complete early '55.
Du Pont	Old Hickory, Tenn.	Dacron	10-20,000,000	Under consideration.
Du Pont	Montague, Mich.	Neoprene	15,000,000	Due to start construction late '54. Complete in '56.
Du Pont	Parlin, N. J.	Polyethylene terephthalate		Under construction. Initial production mid '55. Photographic film base.
Du Pont	Clinton, Iowa	Cellophane		Extensive modernization & expansion underway. Complete late '54.
Du Pont	Old Hickory, Tenn.	Cellophane	2,000,000	20% expansion due to start fall '54.
Du Pont	Parkersburg, W. Va.	Tetrafluoroethylene		100% expansion underway.
Du Pont	Richmond, Va.	Cellophane		Expanding and improving facilities, to be completed late '54.
Dures	Kenton, Ohio	Phenolic molding compounds		Construction due complete by Sept. '54. Production to exceed 64,000,000 pounds per year New process.
H. B. Fuller	Atlanta, Ga.	Adhesives		Third round of expansion completed. Capacity now four times 1949.
Gelvatex Coatings	Anahaim, Calif.	Vinyl acetate emulsion paints	500,000	Output increased six-fold.
General Tire & Rubber	Ashtabula, Ohio	Polyvinyl chloride	6,000,000	Underway.
Goodrich-Gulf Chemicals	Orange, Tex.	Butyl rubber		First plant for Goodrich-Gulf. Esso patents.
Gordon Chemical	Wilmington, Del.	Urea molding compounds		35% capacity boost completed Jan. '54.
Hercules Powder	Hopewell, Va.	Cellulose gum	1,800,000	Certificate of necessity granted.
Hercules Powder	Parlin, N. J.	Chlorinated rubber		50% expansion underway.
Industrial Rayon	Covington, Va.	Nylon-type fiber	5,000,000	Staple fiber unit to be completed late '54. Initial capacity: 6 million pounds per year.
Koppers	Port Arthur, Tex.	Polyethylene		About to start construction. Due complete mid '55.
Monsanto	Addyston, Ohio	Styrene plastics		Planned.
Monsanto	Springfield, Mass.	Polyvinyl chloride	1,200,000	Planned.
Monsanto	Texas City, Tex.	Polyethylene		Under construction. 66 million pounds per year.
Monsanto	Texas City, Tex.	Polyethylene		Plan 66 million pounds per year by '55, 99 by '57. To start operations late '54.
Monsanto	Indian Orchard, Mass.	Polyvinyl chloride	2,700,000	Film plant underway.
Monsanto	Springfield, Mass.	Vinyl butyral interlayer		50% expansion.
Monsanto	Springfield, Mass.	Hi-impact styrene		Increase in capacity by 30 million pounds per year. Underway.
National Petrochemical	Tuscola, Ill.	Polyethylene	14,000,000	Scheduled for completion spring '55. 25 million pounds per year. I.C.I. patents. Under construction.
Olin-Mathieson	Kern, Ind.	Cellophane		To double output to 66 million pounds per year. To operate in '55.
Olin-Mathieson	Red Bluff, Calif.	Cellophane		In design and engineering stage.
Petroleum Chemical	Lake Charles, La.	Butyl rubber	\$29,000,000	To start construction by Nov. '54. To complete by '56.

## Your Inventory of New Plants and Facilities

### What It Contains . . .

This inventory lists some 482 major new plants or facilities planned, under construction or completed in the U.S. during the last half of 1953 and the first half of 1954. It does not include all of the minor new construction projects or any of those costing less than \$100,000.

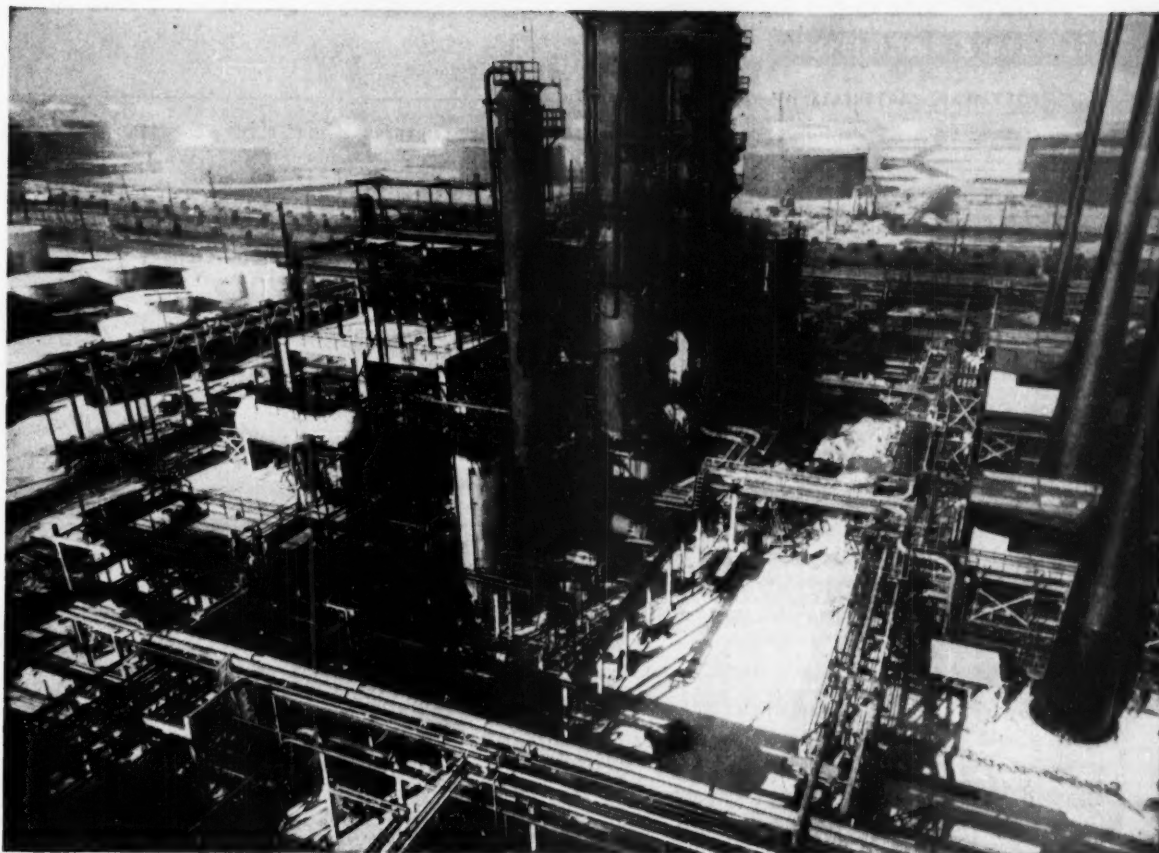
### For Other Listings . . .

For projects not included in the above period, consult CE's tabulations on new plants and facilities published annually since 1951 in these issues: February 1951, 1952 and 1953, January 1954. Next year's Inventory Issue will list projects for the period July 1954-June 1955.

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CHEMICAL ENGINEERING—Inventory Issue 1954

For Inquiry Code Numbers, see Master Index on Page 6

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POLYMERIC MATERIALS (Continued)

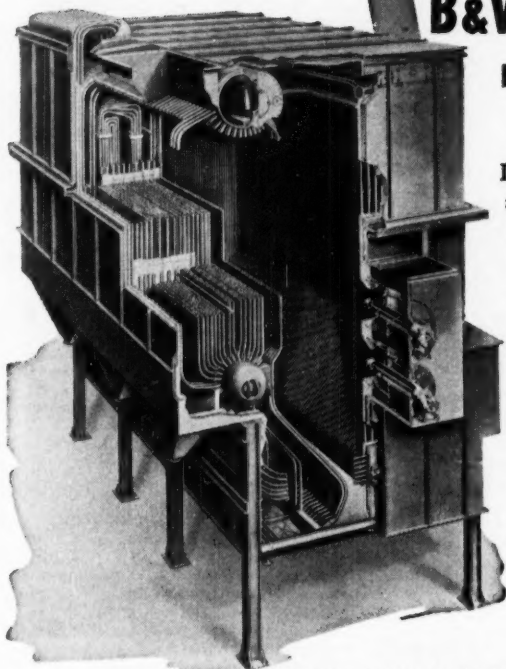
* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Polymer Industries	Stamford, Conn.	Industrial adhesives and textile chemicals		Expanded facilities put into operation early '54. Capacity increased by 50%. Project completed July '54.
Reichhold Chemicals	Asusa, Calif.	Polyesters		Plant opened Dec. '53.
Rubarite	Malvern, Ark.	Synthetic rubber powder	300,000	Underway.
Seiberling	Newcomerstown, Ohio	Polyvinyl chloride		Certificate of necessity granted.
Shawinigan Resins	Springfield, Mass.	Polyvinyl butyral	400,000	On stream March '54. Triples Shell's epoxy output. Largest epoxy resin plant.
Shell Chemical	Houston, Tex.	Epoxy resins		Construction underway. 45 million pounds per year. Due complete spring '55.
Spencer Chemical	Orange, Tex.	Polyethylene	25,000,000	Scheduled to be on stream Jan. '55. 14 million pounds per year.
Standard Oil (Ind.)	Whiting, Ind.	Polyester fiber & film		Facilities completed Dec. '53.
Strock & Wittenberg	Valdosta, Ga.	Alkyds, styrene, polyester resins		
Sure Seal	N. Salt Lake City, Utah	Paraffin and microcrystalline waxes	1,500,000	Scheduled to produce 22 million pounds in '54 in new plant.
Texas Eastman	Longview, Tex.	Synthetic hard wax	3,800,000	Under construction.
Texas Eastman	Longview, Tex.	Polyethylene	7,000,000	Under construction.
U. S. Rubber	Baton Rouge, La.	Styrene-acrylonitrile and rubber blends	1,400,000	Underway.
Union Bay State Chemical	Boston, Mass.	Latex polymer		Construction completed early '54.
Union Carbide (Bakelite)	Marietta, Ohio	Polystyrene	6,000,000	Certificate of necessity granted.
Union Carbide (Bakelite)	South Charleston, W. Va.	Fluorothene resins		Production started April '54.
Union Carbide (Bakelite)	Sandrift, Tex.	Polyethylene	65,000,000	On stream spring '54.
Union Carbide (Bakelite)	Texas City, Tex.	Polyethylene		On stream Nov. '54. Capacity about 60 million pounds per year.
Union Carbide (Bakelite)	Torrance, Calif.	Polyethylene	36,000,000	Under construction. Due complete end '54.
Union Carbide (Linde)	Long Reach, W. Va.	Silicones	14,000,000	60 million pounds per year. Under construction.

SULFUR & SULFURIC

Allied Chemical & Dye (General Chemical)	Baton Rouge, La.	Sulfuric acid	\$2,500,000	In operation early '54.
Allied Chemical & Dye (General Chemical)	Painesville, Ohio	Sulfuric acid	3,300,000	In production late '53.
Allied Chemical & Dye (General Chemical)	River Rouge, Mich.	Sulfuric acid		Scheduled to operate by Sept. '54. Nearly doubles capacity of plant.
American Sulphur & Refining	Sulphurdale, Utah	Sulfur	1,000,000	100 tons per day, 99.5% pure. Underway.
Anaconda Copper Mining	Anaconda, Mont.	Sulfuric acid	1,400,000	Certificate of necessity granted.
Argentine Mining	Rico, Calif.	Sulfuric acid	1,500,000	Will build 200 ton per day plant. To complete mid '55.
Consolidated Chemical Industries	Baytown, Tex.	Sulfuric acid	4,000,000	400 tons per day of 98% acid. In operation late '54.
Consolidated Chemical Industries	Houston, Tex.	Sulfuric acid	4,000,000	Ditto. In operation second quarter '55.
Continental Sulphur & Phosphate	Sulphur, Nev.	Powdered sulfur	200,000	Planned. 50 to 75 tons per day plant. 99.6% sulfur from surface ore. Solvent extraction.
Continental Sulphur & Phosphate	Thermopolis, Wyo.	Sulfur		Expansion to 150 tons per day. Uses new solvent extraction process.
Davison Chemical	Nashville, Tenn.	Sulfuric acid	950,000	Certificate of necessity granted.
Eagle-Picher	Galena, Kan.	Sulfuric acid	4,000,000	240 tons acid per day. To use gases from new zinc roasting plant. Underway.
Freeport Sulphur	Thibodaux, La.	Sulfur		New mine underway.
Freeport Sulphur	Freeport, Tex.	Sulfur	2,700,000	Certificate of necessity granted.
Freeport Sulphur	Garden Island Bay, La.	Sulfur	14,000,000	In operation Nov. '53. 500,000 tons per year capacity has been reached.
Gates Bros.	Wendell, Idaho	Sulfuric acid	800,000	Certificate of necessity granted.
W. R. Grace (Thurston Chemical)	Joplin, Mo.	Sulfuric acid	1,500,000	New unit underway. Plan to make later ammonium sulfate, phosphoric acid, superphosphate, triple superphosphate.
International Minerals & Chemical	Mason City, Iowa	Sulfuric acid	400,000	Certificate of necessity granted.
International Minerals & Chemical	Wilmington, N. C.	Sulfuric acid	500,000	Certificate of necessity granted.
Lone Star Sulphur	Fort Bend Co., Tex.	Sulfur		400-500 tons per day. Started Frasch-mining May '54.
Phillips Chemical	Pasadena, Tex.	Sulfuric acid		Via sulfur from hydrogen sulfide.
Rico Argentine Mining	Rico, Colo.	Sulfuric acid	1,500,000	Complete late summer '55. 200 tons per day. From pyrites.
Sinclair Refining	Marcus Hook, Pa.	Sulfur	300,000	From refinery gases. 20 tons per day. Operating.
Standard Sulphur	Damon Mound, Tex.	Sulfur		Production started Dec. '53.
Stauffer Chemical	Dominguez, Calif.	Sulfuric acid	500,000	Expansion due complete late '54.
Stauffer Chemical	Monongahela, Pa.	Insoluble sulfur	1,000,000	Underway.
Stauffer Chemical	Whiting, Ind.	Sulfuric acid	2,000,000	Certificate of necessity granted.
Sullivan Mining	Kellogg, Idaho	Sulfuric acid	3,000,000	Production started April '54. 250 tons per day. Using Monsanto catalytic process to convert roaster gases.
U. S. Industrial Chemicals	Tuscola, Ill.	Sulfuric acid	2,000,000	140,000 tons per year.
Union Oil	Oleum, Calif.	Sulfur	600,000	50 tons per day. From refinery waste gas. To be completed by Feb. '55.
Westvaco	South Charleston, W. Va.	Sulfur		From hydrogen sulfide. Underway.

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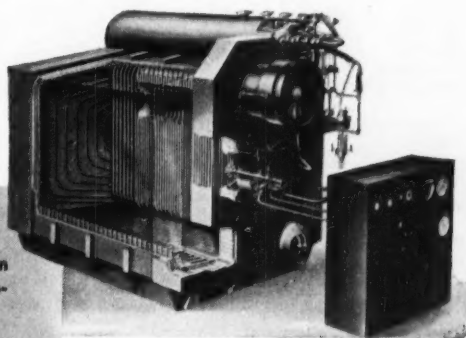


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## SYNTHETIC ORGANICS

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Air Reduction	Calvert City, Ky.	Vinyl acetate		Planned. 30 million pounds per year. To operate early '56.
Allied Chemical & Dye	Orange, Tex.	Ethanolamines		Due to complete construction by May '55.
Allied Chemical & Dye	Orange, Tex.	Ethylene oxide, glycos	\$5,000,000	Production begun Feb. '54. 16,000 tons ethylene oxide per year.
Allied Chemical & Dye (Barrett)	Frankford, Pa.	Phenol	4,800,000	In operation early '54. Full capacity: 23.9 million pounds per year. Cumene process.
Allied Chemical & Dye (Barrett)	Philadelphia, Pa.	Phthalic anhydride		On stream early '54. Capacity: 36 million pounds per year.
Allied Chemical & Dye (General Chemical)	Baton Rouge, La.	Trifluorochlorethylene		In operation early '54. Triples capacity of plant.
Allied Chemical & Dye (National Aniline)	Buffalo, N. Y.	Dye intermediates	1,200,000	In operation late '53.
Allied Chemical & Dye (National Aniline)	Moundsville, W. Va.	Maleic anhydride, fumaric acid	4,500,000	In operation. Full capacity: 10 million pounds per year maleic anhydride; 1 million pounds per year fumaric acid. Catalytic oxidation of benzene.
Allied Chemical & Dye (National Aniline)	Moundsville, W. Va.	Aniline and nitrobenzene	3,200,000	Underway.
Allied Chemical & Dye (National Aniline)	Hopewell, Va.	Adipic acid, caprolactam		For nylon and adipic esters. Caprolactam underway, adipic acid Oct. '54.
Allied Chemical & Dye (Solvay)	Moundsville, W. Va.	Chloroform, carbon tetrachloride, methyl chloride, methylene chloride		In operation
American Cyanamid	Avondale, La.	Monomethylstyrene	8,000,000	Certificate of necessity granted.
American Cyanamid	Bridgeville, Pa.	Phthalic anhydride	6,000,000	Will double present Cyanamid output to 48 million pounds per year. Underway.
Ansul Chemical	Marinette, Wis.	Synthetic pyridines		In operation Nov. '53. Chief outlet: pharmaceuticals. Several hundred thousand pounds per year refined pyridine, co-products.
Archer-Daniels-Midland	Ashtabula, Ohio	Fatty alcohols	8,000,000	Scheduled to operate late '54. Convert linseed, soy bean, and marine oils.
Atlas Powder	Pekin, Ill.	Glycerine and mixed glycols	10,000,000	30 million pounds per year. Certificate of necessity granted.
Atlas Powder	Memphis, Tenn.	Fatty esters of sorbitol and glycerine	1,000,000	Under construction. Ready end of '54.
Brown Co.	Berlin, N. H.	Furfural	Multi-million	From sulfite waste liquor. Being studied.
Celanese	Belvidere, N. J.	Formaldehyde	1,200,000	Certificate of necessity granted.
Commercial Solvents	Agnew, Calif.	Pentaerythritol, formaldehyde		Completed expansion early '54.
Commercial Solvents	Sterling, La.	Nitroparaffins	5,000,000	Increasing capacity from 2 to 10 million pounds per year. To complete late '55.
Delaware Chemicals	Newark, N. J.	Pentaerythritol	1,000,000	Underway.
Dow	Midland, Mich.	Vinyl toluene	15,000,000	May replace styrene in many uses. Underway.
Dow	Freeport, Tex.	Glycerine, bis-phenol	8,500,000	Synthetic glycerine plant and expanded facilities for bis-phenol underway.
Dow	Midland, Mich.	Phenol		Expansion completed late '53. Capacity increased by 60 million pounds per year to give total capacity of 210 million pounds per year.
Du Pont	Deepwater, N. J.	Monochlorodifluoromethane		Expansion completed.
Du Pont	East Chicago, Ind.	Monochlorodifluoromethane		Expansion completed.
Du Pont	Louisville, Ky.	Monochlorodifluoromethane		Due complete fall '55.
Dures Plastics & Chemicals	Tonawanda, N. Y.	Phenol		Expansion on stream late '53. Capacity increased by 25 million pounds per year.
Emery Industries	Cincinnati, Ohio	Dimer acid		Expansion underway.
Enjay	Bayway, N. J.	Ethyl alcohol		Expansion completed late '53. New capacity about 20 million gallons per year.
Eso Standard Oil	Bayway, N. J.	Methyl ethyl ketone	2,900,000	Certificate of necessity granted.
D. D. Feldman	Lake Arthur, La.	Benzene, toluene, xylene	1,300,000	Planned.
Foster-Grant	Baton Rouge, La.	Styrene monomer	4,000,000	In operation April '54. Capacity: 2,000,000 pounds per month.
General Aniline & Film	Calvert City, Ky.	Acetylene derivatives	6,000,000	Scheduled to be in operation late '55. PVP family predominantly.
General Electric	Watford, N. Y.	Methyl chloride	10,500,000	Certificate of necessity granted.
Glidden	Jacksonville, Fla.; Valdosta, Ga.	Terpene chemicals	500,000	Planned.
Goodrich Chemical	Calvert City, Ky.	Acrylonitrile	8,500,000	Under construction. To be completed fall '54. 24 million pounds per year.
Goodyear (Pathfinder Chemical)	Point Pleasant, W. Va.	Styrene		Projected plant may not be built. One reason: sale of gov't. copolymer plants may drop styrene price.
Great Southern Chemicals	Corpus Christi, Tex.	Benzene, toluene		On stream Jan. '54.
Gulf Oil	Port Arthur, Tex.	Ethylene	18-20,000,000	Ready early '55. Three billion cubic ft. per year. Will increase Gulf's output to 5.5 billion cubic ft. per year.
Gulf Oil	Port Arthur, Tex.	Iso-octyl alcohol		In operation June '54. 9 million pounds per year. Oxo process.
Hercules	Burlington, N. J.	Hydrobisulfit alcohol		Expanding to double capacity.
Hercules	Burlington, N. J.	Dimethyl terephthalate	4,000,000	Scheduled for completion May '55. Capacity: 12 million pounds per year. New air oxidation process.
Hercules	Gibbstown, N. J.	Phenol		Scheduled complete Sept. '54. Capacity: 26 million pounds per year.
Hercules	Mansfield, Mass.	Pentaerythritol		Expansion from 18 to 24 million pounds per year. Underway.





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16' diameter, full-scale spray dryer at our Netcong, N. J. Laboratories.



Testing processed samples in the Nerco-Niro laboratory

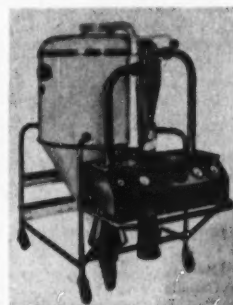
All-inclusive spray-drying facilities for research, for test runs and for custom drying on small or large volume basis are now available to YOU at our new laboratories in Netcong, N. J.

A combination of pilot dryer and a full size industrial unit, designed for the highest degree of flexibility and operated by an experienced staff of spray-drying engineers, can provide the solution to the problems involved in meeting your specific drying requirements.

## Custom Drying Research • Test Runs

Nerco-Niro engineers are at your service, ready to cooperate with you in testing materials and planning production on modern equipment, fully engineered and proved in use.

We invite your inquiries for further information. You are welcome to inspect these new facilities, at your convenience.



32" diameter portable pilot unit

Address all inquiries to:

### Nichols Engineering & Research Corporation

Nerco-Niro Spray Dryer Division  
70 Pine Street, New York 5, N. Y.

Indianapolis

Pasadena

Montreal

**SYNTHETIC ORGANICS (Continued)**

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Hercules	Paulsboro, N. J.	Phenol	8,500,000	Scheduled to operate Sept. '54 26 million pounds per year.
Heyden & Monsanto	Texas City, Tex.	Methanol	8,000,000	Scheduled to be in production by Jan. '55. 25,000,000 gallons per year.
Hooker-Detrex	Ashtabula, Ohio	Perchloroethylene, anhydrous hydrochloric acid	1,000,000	Underway.
Jefferson Chemical	Port Neches, Tex.	Ethanolamines		Facilities for 50% hike in production underway. Much of increased production for morpholine.
Jefferson Chemical	Port Neches, Tex.	Diethylene glycol		New facilities on stream late '53.
Monsanto	Avon, Calif.	Phenol	4,000,000	In full production Nov. '53. Capacity 20 million pounds per year. Sulfonation process.
Monsanto		Phthalic anhydride	5,000,000	Will double output to 50 million pounds per year. Underway.
Monsanto	Monsanto, Ill.	Phenol		Underway.
Monsanto	Texas City, Tex.	Vinyl chloride	7,300,000	Planned.
National Petrochemicals	Tuscola, Ill.	Ethylene, ethyl chloride, ethyl alcohol	22,000,000	In operation Jan. '54. 600,000 pounds ethylene per day, 50 million pounds per year ethyl chloride, 125,000 gal. per day 192 proof ethanol.
Novadel-Agene (Lucidol)	Genesee, N. Y.	Organic peroxides	500,000	New plant built to replace plant at Tonawanda destroyed by explosion.
Oronite Chemical	Richmond, Calif.	Phenol, acetone	4,000,000	On stream March '54. 35 and 20 million pounds per year, respectively.
Oronite Chemical	Richmond, Calif.	Isophthalic acid	Multi-million	50 million pounds per year. Scheduled complete mid '55.
Oronite Chemical	Richmond and El Segundo, Calif.	Para-xylene		Expansion to 35 million pounds per year underway.
Pau American Refining	Texas City, Tex.	Methyl mercaptan	5,000,000	Under construction. To operate late '54. Full capacity: 5 million pounds per year.
Petrocarbon Chemicals	Dallas, Tex.	Naphthalene, toluene, benzene, xylene	1,000,000	Underway. 1,000 bbl. per day Houdriformer.
Phillips Chemical	Big Spring, Tex.	Para-xylene		In operation Jan. '54. 98% minimum purity. Continuous fractional crystallization. 5 million pounds per year.
Phillips Petroleum	Borger, Tex.	Cyclohexane	1,750,000	Expansion to 17 million gallons per year. In operation.
Quaker Oats	Memphis, Tenn.	Furfuryl alcohol	600,000	In production late '53.
Reichhold Chemicals	Elizabeth, N. J.	Phthalic anhydride, maleic anhydride		Plan new plant to boost their production to 80 million pounds per year for phthalic, to 10 million pounds per year for maleic.
Reichhold Chemicals	Tuscaloosa, Ala.	Pentaerythritol, formaldehyde	3,000,000	Planned. Capacity: 5 million and 30 million pounds per year respectively.
Schenley Distillers	Kansas City, Mo.	Ethyl alcohol	2,000,000	Certificate of necessity granted (previously denied).
Shell Chemical		Isopropyl alcohol, acetone, methyl isobutyl ketone	7,500,000	Certificate of necessity granted.
Shell Chemical	Norco, La.	Allyl chloride, epichlorohydrin		Plant to be completed late '54. Will ship to Houston for making epoxy resins and glycerine. Will boost glycerine by 25 million pounds per year.
Shell Chemical	Houston, Tex.	Synthetic glycerine	9,000,000	Expansion due complete 4th quarter '54.
Sherwin-Williams	Chicago, Ill.	Phthalic anhydride	1,000,000	Expansion due complete late fall '54 will boost production from 2 to 6 million pounds per year.
Sinclair Chemicals	Marcus Hook, Pa.	Para-xylene, toluene, xylene solvents		Production to start early '55. 10 million pounds per year.
Spencer	Chicago, Ill.	Hexamine		Unit on stream end of '53. 1,500,000 pounds per year minimum.
Standard Oil (Ind.)	Whiting, Ind.	Para-xylene		Scheduled for operation Jan. '55. 14 million pounds per year.
Stauffer	Louisville, Ky.	Carbon tetrachloride	3,650,000	On stream early '54.
Texas Butadiene & Chemical	Texas	Butadiene	26,000,000	40,000 tons per year. Planned. Direct from butane.
Thiochemicals, Inc.	Port Arthur, Tex.	Methyl mercaptan	500,000	From hydrogen sulfide. Planned.
U. S. Gov't. (Chemical Corps)	Muscle Shoals, Ala.	"Dicaloro"	50,000,000	In operation. Intermediate in production of nerve gases.
U. S. Steel	Clairton, Pa.	Pyridene		In volume production late '53.
Union Carbide	Montague, Mich.	Acetylene	2,000,000	Proposed.
Union Carbide (Carbide and Carbon)	Searift, Tex.	Butadiene	2,500,000	Planned. Certificate of necessity granted.
Union Carbide (Carbide and Carbon)		Ethyl and methyl acrylates		New plant bought in June '54.
Warren Petroleum	Conroe, Tex.	Pentaerythritol, other LPG oxidation products	2,000,000	2.5 million pounds per year PE, 4 ditto methanol, 2 ditto acetaldehyde. Underway.

**OTHERS**

Alby Asphalt Refining	Hammond, Ind.	Asphalt	\$2,000,000	In production early '54. To make 50 million gallons per year.
Alcoa	Bauxite, Ark.	Hydrated aluminas		Second of 4 units in full operation.
Alcoa	Mobile, Ala.	Alumina		Capacity increased by 1/3 early '54 to over 100,000 tons per year.



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To Procon personnel, the meeting of guarantees is an undivided responsibility . . . theirs alone . . . beginning the moment they are assigned to a new job . . . continuing throughout the construction period . . . ending only after the project has been completed to the customer's satisfaction.

It is this acknowledgement of responsibility which assures you of process construction that will meet your particular needs, whatever they may be. It is your guarantee that every detail, no matter how small or complex, will be carried out according to your specifications.

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**OTHERS (Continued)**

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Alcoa.....	Rockdale, Tex.....	Dried lignite.....	.....	Underway.
Vern E. Alden Co.....	Chicago, Ill.....	B <sub>2</sub> concentrate.....	1,000,000	From sewage. Considering. Milorganite by-product. Operating pilot plant. Double output. Underway.
Allied Chemical & Dye.....	Baton Rouge, La.....	Refrigerants.....	.....	Planned. To be ready early '55.
(General Chemical)	Danville, Ill.....	Refrigerants.....	.....	Work completed on new battery of ovens late '53. Byproducts include ammonia, crude benzol, carbolic oils. 350 tons coal per hour.
Allied Chemical & Dye.....	Ashland, Ky.....	Coke-oven chemicals.....	.....	Started up early '54.
(General Chemical)	.....	.....	2,000,000	Schedule for completion by fall '54. Mercury cell.
Allied Chemical & Dye.....	.....	.....	.....	Underway.
(Bemet-Solvay)	.....	.....	10,000,000	Engineering underway. New process (chemical oxidation).
Allied Chemical & Dye (Solvay)...	Moundville, W. Va.....	Chlorine, caustic soda.....	15,000,000	Underway. Barium sulfate-coated.
Allied Chemical & Dye (Solvay)...	Syracuse, N. Y.....	Caustic potash.....	2,000,000	Tract acquired. Will process crude asphalt from Venezuela. Underway.
Allied Chemical & Dye (Solvay)...	Syracuse, N. Y.....	Soda ash.....	.....	Production started June '54. Doubles output.
Allied Chemical & Dye (Solvay)...	Syracuse, N. Y.....	Hydrogen peroxide.....	.....	Scheduled for completion late '55.
Allied Paper Mills.....	Kalamazoo, Mich.....	Photo-base paper.....	.....	Certificate of necessity granted.
American Bitumuls & Asphalt.....	Miami Ford, Ohio.....	Asphalt.....	4,000,000	Production started late '53.
American Cyanamid.....	Bound Brook, N. J.....	Rubber accelerators.....	.....	Due complete mid '55. 250% increase in capacity to 60,000 tons per year.
American Cyanamid.....	Savannah, Ga.....	Titanium dioxide pigments...	14,000,000	Plant opened late '53.
American Cyanamid.....	Willow Island, W. Va.....	Platinum catalyst.....	1,500,000	Underway.
Archer-Daniels-Midland.....	Buffalo, N. Y.....	Linseed oil.....	2,000,000	Expansion planned.
Arizona Chemical.....	Panama City, Fla.....	Refined tall oil.....	.....	For use in reforming petroleum.
Armour & Co.....	Kankakee, Ill.....	ACTH, trypsin, insulin, gamma-globulin, other pharmaceuticals	12,000,000	Certificate of necessity granted.
Arnold, Hoffman.....	Providence, R. I.....	Dyes and intermediates.....	.....	Underway.
Atlas Powder.....	Marshall, Tex.....	Activated carbon.....	1,250,000	Expansion planned.
Baker & Co.....	Newark, N. J.....	Platinum catalyst.....	2,500,000	For use in reforming petroleum.
Barium & Chemicals.....	Willoughby, Ohio.....	Barium and strontium compounds	3,000,000	Certificate of necessity granted.
Bay Chemical.....	Weeks Island, La.....	Silica-alumina catalyst.....	2,000,000	Production begun late '53. Capacity: 450 tons per month.
Bethlehem Steel.....	Laekawanna, N. Y.....	Metallurgical coke.....	1,500,000	Certificate of necessity granted.
Bethlehem Steel.....	Steelton, Pa.....	Coke and coke chemicals.....	7,000,000	Certificate of necessity granted.
Bloekson Chemical.....	Joliet, Ill.....	Heavy industrial chemicals...	.....	Major expansion of current facilities underway.
Bowaters Southern.....	Calhoun, Tenn.....	Newsprint.....	51,000,000	Capacity: 50,000 tons kraft pulp and 125,000 tons newsprint per year. Underway.
Brea Chemicals.....	Brea, Calif.....	Dry ice.....	750,000	70 tons per day. In production July '54.
Burdett Oxygen.....	Cleveland, Ohio.....	Argon.....	.....	Plans construction in '55. 100,000 cubic ft. per day.
Chemical Lime.....	Baker, Ore.....	Chemical-grade lime.....	.....	2-kiln plant (30,000 tons per year) well along in planning stage. Eventually 66,000 ton total capacity. Will use wood waste to fire kilns.
Crosby Chemicals.....	Picayune, La.....	Refined pulp and paper wastes	2,000,000	Expansion underway.
Cromett.....	Cromett, Ark.....	Paper.....	20,000,000	Plans announced late '53. To produce 150 tons per day bleached container board.
De Soto Paint & Varnish.....	Garland, Tex.....	Paint vehicles.....	.....	In operation early '54. Two million gallons per year.
Dewey and Almy.....	Acton, Mass.....	Resin-impregnated battery separators	.....	Will expand.
Donner-Hanna Coke.....	Buffalo, N. Y.....	Metallurgical coke, byproduct chemicals	365,000	Certificate of necessity granted.
Dow.....	Freeport, Tex.....	Soda ash.....	3,000,000	Starting construction. 300 tons per day.
Dow-Corning.....	Midland, Mich.....	Fine synthetic silica.....	.....	30 ton per month plant scheduled to go into production early '54. Uses Degussa process.

## Your Inventory of New Plants and Facilities

### What It Contains . . .

This inventory lists some 482 major new plants or facilities planned, under construction or completed in the U.S. during the last half of 1953 and the first half of 1954. It does not include all of the minor new construction projects or any of those costing less than \$100,000.

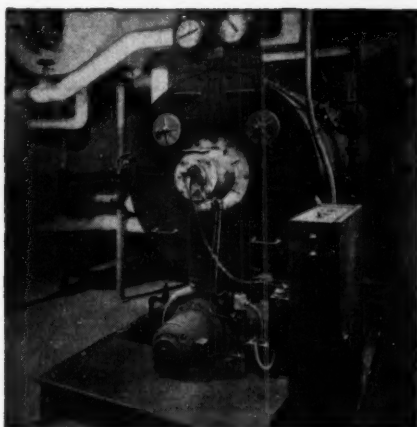
### For Other Listings . . .

For projects not included in the above period, consult CE's tabulations on new plants and facilities published annually since 1951 in these issues: February 1951, 1952 and 1953, January 1954. Next year's inventory issue will list projects for the period July 1954-June 1955.

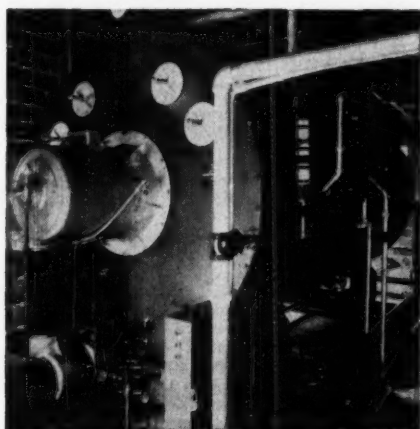
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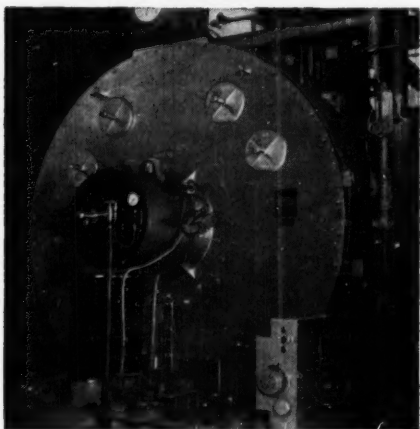




Steam for heating new fertilizer plant is supplied by this 40 hp. *Powermaster*.



This 400 hp. *Powermaster* generates 100 psi. steam for processing industrial fish oil.



Process steam at 175 psi. for rubber products plant is supplied by this 500 hp. *Powermaster*

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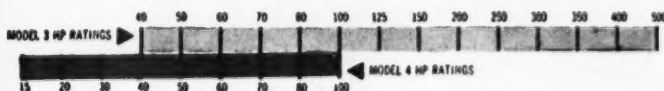
*Powermaster*<sup>®</sup>  
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In chemical plants, *Powermaster* Packaged Automatic Boilers are supplying steam for processing and heating with outstanding reliability and economy.

*Powermaster* savings start with simplified installation. No special foundation or costly stack is required. As delivered, space-saving *Powermasters* are completely factory-assembled, fully equipped and wired ready for operation as soon as water, fuel, electrical and flue gas connections are made.

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Pressure range: 15 to 250 psi., steam or hot water.

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## PACKAGED AUTOMATIC BOILERS

Sizes to 500 HP; pressures to 250 psi.

**ORR & SEMBOWER, INC.** • Established 1885 • Morgantown Road, Reading, Penna.

## OTHERS (Continued)

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Du Pont.....	Beaumont, Tex.....	Methionine.....	4,000,000	Underway.
Du Pont.....	Belle, W. Va.....	Synthesis gas.....	4,000,000	Replacement of facilities with more modern equipment. Underway.
Du Pont.....	Deepwater, N. J.....	Freon.....	2,000,000	Underway.
Du Pont.....	Lawley, Fla.....	Ilmenite.....	3,000,000	To operate early '55. 100,000 tons per year of ore.
East Texas Pulp & Paper.....	Silabee, Tex.....	Paper, pulp.....		Construction scheduled for completion late '54. 90,000 tons bleached sulfate pulp and paper board per year.
Ethyl.....	Houston, Tex.....	Anti-knock compound.....		15% expansion underway. Due complete early '55.
Ethyl.....	Baton Rouge, La.....	Anti-knock compound.....		15% expansion underway. Due complete early '55.
Fisher Chemical.....	Fair Lawn, N. J.....	Fine chemicals.....		Work underway. To complete fall '54.
Foot Mineral.....	Kings Mountain, N. C.; Sunbright, Va.	Lithium compounds.....	Multi-million	To expand at Sunbright. New mining and spodumene ore beneficiation facilities at Kings Mountain. 5,250,000 pounds lithium carbonate per year.
Ford Motor.....	Dearborn, Mich.....	Coke and byproducts.....	200,000	Certificate of necessity granted.
Gaston Chemicals.....	Spencer Mountain, N. C.	Dyestuffs, plastics.....		Underway.
General Aniline & Film.....	Linden, N. J.....	Chlorine, caustic.....	5,000,000	Will build. 26 tons per day chlorine.
Goodyear Tire & Rubber.....	Niagara Falls, N. Y.....	Synthetic rubber chemicals.....	4,000,000	Underway.
Great Northern Paper.....	Millinocket, Me.....	Newsprint.....		Expansion underway. To make newsprint from hardwood.
Great Western Sugar.....	Johnstown, Colo.....	Monosodium glutamate.....	2,500,000	From sugar beet residues. Plant to operate early '55.
Hercules Powder.....	Brunswick, Ga.....	Chlorine.....		Chlorine recovery plant completed.
Hercules Powder.....	Hopewell, Va.....	Dissolving-grade wood pulp.....	7,000,000	Certificate of necessity granted.
Hoberg Paper Mills.....	Green Bay, Wis.....	Torula yeast.....	2,500,000	To use sulfite waste from pulp mill. Project underway.
Hooker Electrochemical.....	Montague, Mich.....	Chlorine, caustic.....	12,000,000	In operation. 100,000 tons per year.
Imperial Sugar.....	Sugar Land, Tex.....	Cane sugar.....	3,000,000	Expansion planned.
International Minerals & Chemicals.....	Bonnie, Fla.....	Uranium concentrates.....		In operation. Recovery from processing of phosphate rock in manufacture of fertilizer. 60,000-160,000 pounds $U_3O_8$ per year.
International Minerals & Chemicals.....	Carlsbad, N. M.....	Hydrochloric acid, magnesium oxide.....		Production started Jan. '54. Processes magnesium chloride.
International Minerals & Chemicals.....	Janesville, Wis.....	Refractories.....		75,000 tons per year. Underway.
International Minerals & Chemicals.....	Southern Conn.....	Feldspar.....		Probably will use Le Baron-Lawyer dry beneficiation process.
International Paper.....	Camden, Ark.....	Paper.....	2,000,000	Expansion underway. Current capacity: 500 tons per day.
John-Manville.....	Lompoc, Calif.....	Diatomite products.....		Synthetic silicates plant underway. For use as inert absorbents, bulking agents, extenders. To operate by mid '56.
Jones & Laughlin Steel.....	Cleveland, Ohio.....	Metallurgical coke.....	500,000	Certificate of necessity granted.
Kaiser Gypsum.....	Seattle, Wash.....	Gypsum board.....	4,000,000	Facilities scheduled to be in operation by Dec. '54.
Kerr-McGee Oil Industries.....	Shiprock, N. M.....	Uranium and vanadium concentrates.....	3,000,000	Planned.
Ketchikan Pulp & Paper.....	Ward Cove, Alaska.....	Pulp.....	46,000,000	Using magnesia-base pulping. In operation June '54. 130,000 tons per year dissolving grade pulp.
Koppers.....	Salem, Va.....	Wood preservatives.....		Underway.
Leslie Salt.....	California (Napa, Sonoma, Solano Counties)	Salt.....		Developing new tideland facilities. Will increase domestic production by 1958 to 1.5 million tons.
Lindsay Chemical.....	W. Chicago, Ill.....	Rare earth chemicals.....		Expansion underway.
Lion Oil.....	Luling, La.....	Carbon dioxide.....	550,000	Will build. 42 tons per day of liquid and solid forms.
Liquid Carbonic.....	Houston Ship Channel, Tex.....	Carbon dioxide.....		Plant due complete mid '55. Liquid, solid, and gas.
Lithium Corp. of America.....	Reese, N. C.....	Lithium carbonate and hydroxide.....	7,000,000	New facilities to operate Jan. '55.
Manganese, Inc.....	Henderson, Nev.....	Manganese concentrate.....		Producing 45% manganese concentrate in nodule form.
Mathieson.....	Morgantown, W. Va.....	Caprolactam.....		Will supply American Enka for nylon. Underway.
Mathieson.....	Saltville, Va.....	Soda ash.....		In operation late '53. 50,000 tons per year. New coarse light ash for glass making.
Maumee Chemical.....	Toledo, Ohio.....	Saccharin and intermediates.....		On stream. New process starts with ammonia and phthalic anhydride.
Midwest Carbide.....	Pryor, Okla.....	Calcium carbide.....	3,000,000	Underway.
Monsanto.....	Monsanto, Ill.....	Lubricating oil additives.....		Expanding to double production. Scheduled to start up Sept. '54.
Monsanto.....	Everett, Mass.....	Sodium bisulfite.....		Underway.
Monsanto.....	Soda Springs, Idaho.....	Phosphorus.....		Second furnace under construction. Will bring company total to eight (six at Monsanto, Tenn.)



COUNT ON **25** YEARS  
OF ECONOMICAL SERVICE

from a  
**PREFERRED  
UNIT  
STEAM GENERATOR**

*Preferred Unit Steam Generators are available in sizes from 20 to 600 B.H.P. and pressures from 15 to 250 psi, to burn oil, gas or in combination*

*All units are factory fire-tested before shipment.*

**B**ecause of the economies it realizes in low overall operating and maintenance costs, a Preferred installation pays for itself in *five years or less*, amortization included. Yet it gives 25 years expectancy of sustained high thermal efficiency (80% or more) over the entire range of load demand. Thus, four-fifths of the life of the installation costs you nothing!

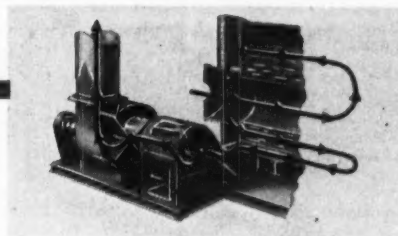
#### 10 DESIGN FEATURES ARE THE REASON

Incorporated in the Preferred Unit Steam Generator are ten design features which make possible the remarkable record of this "packaged" boiler. Other makes may have some of these features, but only the Preferred has ALL TEN. They are combined to assure lowest cost steam generation by cutting fuel consumption by 10% or more and, above all, by cutting to a minimum such maintenance costs as refractory repairs, tube cleaning and corrosion-caused replacements. Although hundreds of Preferred Generators are in daily operation, there has never been a single case of furnace loss. There has never been a single loss of a pressure vessel.

The inter-related functions of Preferred's ten design features are discussed in Bulletin 2000. You'll find it interesting and profitable to study. Write for a copy.

### PREFERRED UTILITIES MFG. CORP.

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#### EXPANSILE PRECIPITATOR

Holds and contains entrained non-combustibles and insures clean, smokeless operation. It makes possible the maintenance of maximum gas velocities in all tubes at all times by preventing the build up of deposits, particularly at the last pass.

The Expansile Precipitator is one of the 10 design features which insure long service life and low overall maintenance and operating costs. Here are the other nine...

- Five Sq. Ft. of Heating Surface per Boiler HP
- Four Pass Gas Travel
- Down Draft Design
- Induced Draft
- Intermediate Furnace Position
- Anti-Stress Deck
- Staggered Tubes
- Dual Purging Action
- Full Automatic Oil and/or Gas Burners



**OTHERS (Continued)**

* FIRM	* LOCATION	* PRODUCTS	* DOLLARS	* JOB STATUS & REMARKS
Monanto.....		Isocyanates.....		Will join with German firm to build plant in U. S.
Moreland Chemical.....	Spartanburg, S. C.....	Textile chemicals.....	350,000	Underway.
National Aluminate.....	South Gate, Calif.....	Microspheroidal cracking catalyst.....	Several million	Underway.
National Cylinder Gas.....	Chicago, Ill.....	Liquid oxygen.....	3,500,000	Construction planned.
National Cylinder Gas.....	Knoxville, Tenn.....	Nitrogen, oxygen, acetylene.....		Expanding to 10 million cubic ft. per month (all three gases).
National Lead.....	St. Louis, Mo.....	Titanium dioxide.....		New units to operate end '55. Additional capacity: 36,000 tons per year.
Newport Industries.....	Bay Minette, Ala.....	Tall oil products.....	2,700,000	New unit on stream. Capacity now 24,000 tons per year. Processing black liquor skimmings and crude tall oil.
Nicholls Chemical.....	Canon City, Colo.....	Lithium compounds.....	500,000	50,000 pounds lithium hydroxide per month.
Ninol Laboratories.....	Chicago, Ill.....	Detergent sulfonates.....		First phase of current expansion completed June '54.
Oldbury Electrochemical.....	Columbus, Ga.....	Sodium chloride.....	3,500,000	25,000,000 pounds per year. Under construction.
Oldbury Electrochemical.....	Columbus, Ga.....	Sodium sulfide.....	250,000	Will build.
Olin-Mathieson Chemical.....	Model City, N. Y.....	Classified.....		Planning new facilities. Site of \$30 million Ontario Ordnance Works built by the government during World War II.
Parke-Davis.....	Rochester, Mich.....	Polio vaccine.....		Scheduled for completion Oct. '54.
Pennsalt.....	Wyandotte, Mich.....	Ferric chloride, anhydrous.....		Capacity doubled to 25,000 tons per year.
Permalex Chemical.....	Kansas City, Kan.....	Hydraulic brake fluid and sealing compounds.....	500,000	To be ready fall '54.
Phillips Chemical (Gov't. contract)	Etter, Tex.....	Nitric acid.....	1,800,000	Completed. Expanded by 110 tons per day. Formerly Cactus Ordnance Works.
Rayonier.....	Jesup, Ga.....	Chemical cellulose.....	23,000,000	In production. Capacity close to 100,000 tons per year. Uses new process.
Rayonier.....	Houquiam, Wash.....	Lignin extract.....		Underway.
Republic Chemical.....	Curtis Bay, Md.....	Nickel sulfate.....		4 million pounds per year. Underway.
Reynolds Metals.....	Corpus Christi, Tex.....	Alumina.....	42,000,000	Work completed. 1,000 tons per day.
Rhineland Paper.....	Rhineland, Wis.....	Bleached semi-chemical pulp.....	700,000	Certificate of necessity granted.
S & W Chemical.....	La Porte, Tex.....	Phosgene.....		Construction due complete Sept. '54.
St. Helens Pulp & Paper.....	St. Helens, Ore.....	Pulp and paper.....	15,000,000	Expansion planned. Will process 35,000 tons per year bleached kraft pulp.
St. Regis Paper.....	Pensacola, Fla.....	Kraft paper.....	4,500,000	Underway.
Scott Paper.....	Everett, Wash.....	Pulp.....		Expanding facilities by 120 tons pulp per day.
Sharon Steel.....	Farrell, Ohio.....	Coke-oven chemicals.....	16,500,000	To build 75 byproduct ovens.
Shea Chemical.....	Jeffersonville, Ind.....	Phosphorus compounds.....		In partial operation. Phosphoric acid (50,000 tons per year) on stream. 30,000 tons per year sodium tripolyphosphate, and 10,000 tons per year sodium metaphosphates to follow.
Sherwin-Williams.....	Chicago, Ill.....	Phthalocyanine blue pigment.....	1,100,000	Tentatively approved.
Smith-Douglas.....	Streator, Ill.....	Phosphoric acid.....		In full production early '54. First U. S. firm to use Belgian Prayon process. 95% yield of 30% acid. 900 tons of P <sub>2</sub> O <sub>5</sub> per day.
Southern Cement.....	Roberts, Ala.....	Portland cement.....		Underway.
Southland Paper Mills.....	Lufkin, Tex.....	Newsprint.....		Will expand by 70,000 tons per year to 200,000 tons per year.
Standard Chemical Products.....	Charlotte, N. C.....	Textile chemicals.....	750,000	Underway.
Standard Oil (N. J.).....	Fayetteville, N. C.....	Asphalt.....		Planned.
Tin Processing.....	Texas City, Tex.....	Hydrochloric acid.....		In operation. 600,000 gallons per month 31.5% HCl. Recovery from tin leaching waste.
U. S. Gov't (AEC).....	Rocky Flats, Colo.....	Atomic fission products.....	44,000,000	Underway.
U. S. Gov't (AEC).....	Macomb, Ill.....	Explosives.....	29,000,000	Entire project cancelled (construction had already begun).
U. S. Steel (Tenn. Coal & Iron)...	Birmingham, Ala.....	Coal-tar chemicals.....		New units completed.
U. S. Steel.....	Gary, Ind.....	Metallurgical coke.....	50,000,000	Certificate of necessity granted.
Universal Oil Products.....	McCook, Ill.....	Petroleum catalyst.....		Underway.
Valentine Pulp & Paper.....	Lockport, La.....	Pulp, newsprint.....	4,500,000	In operation late '53. 50 tons pulp per day. New process uses sugar cane bagasse as raw material.
Velsicol.....	Memphis, Tenn.....	Chlorine, caustic.....	2,000,000	Expansion completed late '53. New unit produces 45 tons chlorine per day.
Victor Chemical.....	Morrisville, Pa.....	Phosphorus chlorides.....		Underway. Will more than double company's present capacity for phosphorus oxychloride and phosphorus trichloride.
Virginia-Carolina.....	Charleston, S. C.....	Phosphoric anhydride.....		Plant on stream late '53.
Virginia-Carolina.....	Cincinnati, Ohio.....	Phosphoric acid and phosphates.....	1,000,000	Underway.
Virginia-Carolina.....	Nichols, Fla.....	Uranium concentrates.....		In operation. Recovery of uranium values from processing of phosphate rock in manufacture of fertilizer.
Vitro Uranium.....	Salt Lake City, Utah.....	Uranium concentrates.....	500,000	Expanding facilities.
West Virginia Pulp & Paper.....	Charleston, S. C.....	Semi-chemical pulp.....	3,000,000	Increase of 200 tons per day underway.
Western Electrochemical.....	Henderson, Nev.....	Perchloric acid.....		Planned.
Witco.....	Perth Amboy, N. J.....	Asphalt.....		Production increased by 1/3.
Wyandotte Chemicals.....	Wyandotte, Mich.....	Chlorine, soda ash.....		Production started late '53 on 300-ton unit. Increases firm's chlorine capacity 75%. Soda ash output up 20%.
Zirconium Corp. of America.....	Solon, Ohio.....	Zirconium oxide, zirconium chemicals.....	200,000	Three tons oxide per day.



# Making pure Ethylene from Raw Gas

.....

Here, silhouetted against the sky, are giant distillation and absorber towers in the new Canadian Industries Limited Plant at Edmonton, Alberta. Since late last year this plant has been producing highest purity ethylene from natural gas for use in the manufacture of polyethylene.

These operations involve the recovery of ethane from dry gas by absorption at elevated pressure in a "sponge oil." This "sponge oil" is then stripped of its ethane content which in turn is "cracked." The resulting ethylene is then compressed, dried, separated and purified by fractional distillation at 500 p.s.i., and stored under pressure as a liquid.

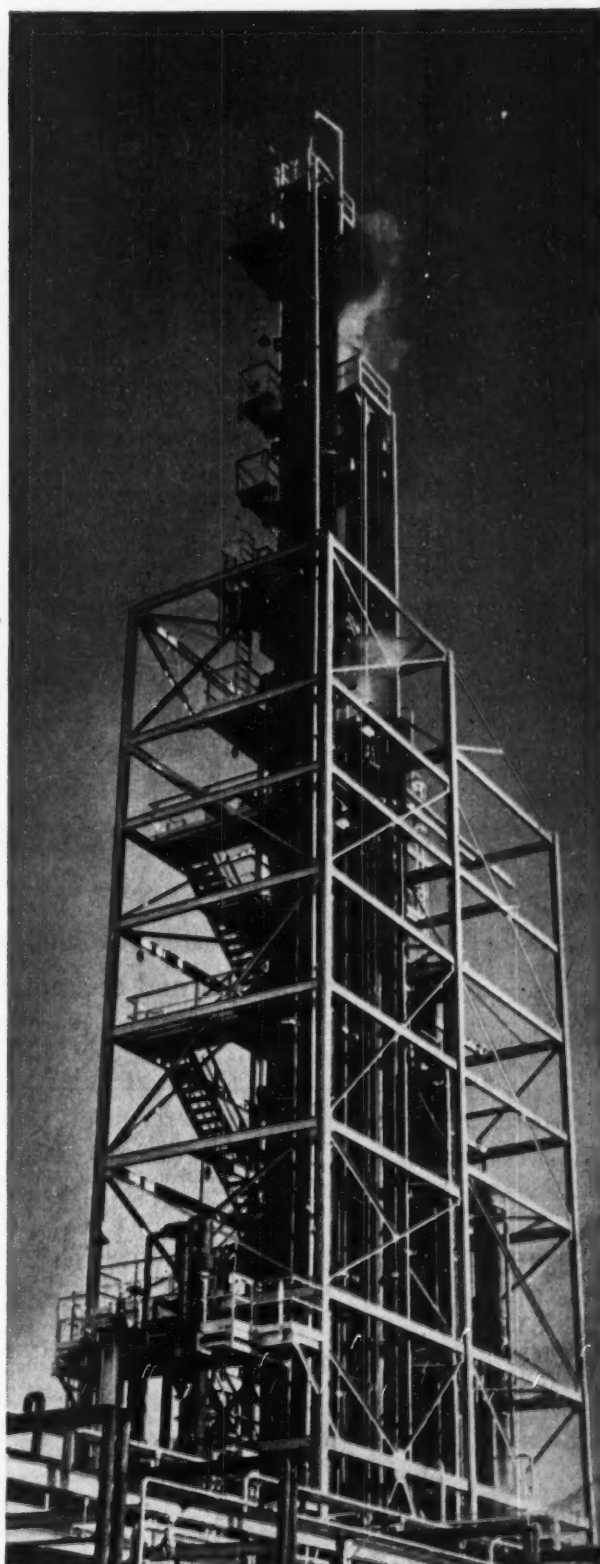
Graver fabricated four of these towers to ASME standards for this installation. It was extremely important that such equipment be precision made to eliminate the dangers of leakage and distortion.

However, Graver is accustomed to fabricating to the highest standards. Towers, tanks, pressure vessels of every kind are built by Graver to satisfy the most exacting needs of the leading chemical and petroleum companies. For *very* highly specialized jobs, call on Graver.

## **GRAVER TANK & MFG. CO., INC.**

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...specialists in the fabrication of  
towers, tanks and process vessels

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**Inventory of New Processes and Technology...**

... A master checklist, organized for fast reference, of 294 major process and technology advances during the past 18 months.

**FATS AND OILS**

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Animal fats.....	Rapid heating.....	Kingan & Co..... Indianapolis, Ind.	Fatty tissue is ground to fluid mass, pumped through continuous heat exchanger to rupture cells, then centrifuged. Cuts processing time to 15 sec.; other savings.	Demonstrated on full scale. Company plans to market package plants.
Cottonseed oil.....	Filtration-extraction	Mississippi Cottonseed..... Products Co. Greenwood, Miss.	Process eliminates prepressing of seed. Cooked meats are extracted with hexane and slurry filtered on continuous horizontal filter. Maro is counter-currently washed on the filter.	Developed by Lukens Steel Co. Plant is in operation handling 7,100 lb./hr. of cooked meats.
Drying oils.....	Hardening.....	Meyercood Co..... Chicago, Ill.	Process hardens drying oils in 2 to 20 sec. by use of sulfur dichloride vapor.	Called Chem-Dry process, developed by Armour Research Foundation of Illinois Inst. of Technology.
Fatty acids.....	Splitting.....		Makes modern continuous fat splitting practical for small producers.	Offered by Blaw-Knox.
Fish oils.....	Vacuum polymerization		Fish oils, following pre-treatment, are treated under vacuum at 200-250 C. with wet steam which superheats during process to give special effect.	Process developed in Germany by Bamag-Meguin A. G.; available in U. S. from General Industrial Development Corp.
Hydroxylated fats...	Peroctic oxidation.	Baker Castor Oil Co..... Bayonne, N. J.	Cheap vegetable oils or animal fats are esterified, then oxidized with peroctic acid. Initial products are vinyl resin plasticizers.	Developed by USDA. Plant in commercial operation. Two other companies have also been licensed to use the process.
Margarine.....	Compounding.....	Armed forces.....	Saturated monoglycerides are melted with vegetable oils and quickly chilled. Mixture can be spread at -4 F., retains its form at 110 F.	Developed by USDA.

## What It Contains . . .

This is CE's fifth annual inventory of major new processes and new technology developments in the chemical process industries. This issue includes 294 important new advances that have been announced, commercialized or that have become particularly newsworthy during the eighteen-month period which includes the year 1953 and the first half of 1954. We have tried to make this inventory complete for all major developments publicly announced; we have made little attempt to include "secret" developments or those unannounced projects still in progress. To make this listing more valuable as a checklist or quick reference, we have digested each item to its factual core. For more information we suggest you contact the firm mentioned as using or having developed the new method.

## For Other Listings . . .

The listing in this first Inventory Issue covers only the eighteen-month period from January 1953 through June 1954; this is approximate since it's obviously difficult to pinpoint the exact "time" of a development. For projects not included in this period, consult the New Processes & Technology tabulations initiated by CE in 1951 and published annually since that year in these issues: February 1951, 1952 and 1953, January 1954. These five surveys, most of which cover a two-year period, have listed a total of some 1,100 technological advances. Our next or 1955 annual Inventory Issue will list new developments for the coming twelve months. This annual inventory of new chemical processes and technology advances is a feature exclusive to this publication.

### FATS AND OILS (Continued)

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Peanut meal . . . . .	Solvent extraction . .	British Extracting Co. . . . . Bromborough, England	Extraction done at room temperature instead of usual 40 C. and desolventizing is done under vacuum. Purpose is to avoid thermal degradation of meal.	Plant is turning out 100 tons/day of meal. Product goes to ICI to make Ardill protein fiber.
Safflower oil . . . . .	Catalytic isomerization	Pacific Vegetable Oil Corp. Los Angeles, Calif.	Produces conjugated drying oil with low linolenic content.	Semi-works plant making tankcar lots. Is second U.S. plant making conjugated oils.
Soybean meal . . . . .	Solvent extraction . .	Central Soya Co. . . . . Fort Wayne, Ind.	Solvent-extracted seeds are cooked to remove solvent rapidly, causing cell walls to explode and free protein for more ready digestion.	In operation. Claimed to give meal of better taste, 100% higher thiamin content, with higher amino acid availability.
Tung oil . . . . .	Solvent extraction . .	Crosby Forest Products Co. Picayune, Miss.	Tung nut press cake has 10-12% oil content. Solvent extraction process reduces this to less than 0.5%. Increase in yield is 20 to 25 lb. of oil per ton of whole nuts. Solvent is hexane.	New process for tung nut processors; idea borrowed from soybean technology.
Vegetable oils . . . . .	De Smet . . . . .	Cargill Co. . . . . Various	Prepared seed is fed onto horizontal moving screen, with solvent sprayed onto moving bed from above in countercurrent scheme. Oil is recovered from solvent in falling film evaporator and vacuum stripping column.	Developed in Belgium. Available in U. S. through Stockdale Engineering Co., Philadelphia.

### FERTILIZERS AND FERTILIZER CHEMICALS

Ammonia synthesis gas	Burning peat . . . . .	Eire Government . . . . . Ireland	Eire considering construction of a large ammonium nitrate plant using peat as the raw material, to reduce its \$26 million annual fertilizer imports.	
Ammonia synthesis gas	Coal partial combustion	Du Pont Co. . . . . Polychemicals Dept. Belle, W. Va.	Powdered coal burned in fluidized bed in atmosphere of steam and deficient oxygen in furnace similar to conventional slag-tap boiler furnace. Produces CO and hydrogen.	Process being tried out on large scale to make synthesis gas for ammonia, eliminate coke ovens and gas producers. Developed jointly by Du Pont, Babcock & Wilcox, and Bureau of Mines.
Ammonia synthesis gas	High-pressure reforming	Shell Chemical Co. . . . . Ventura, Calif.	Natural gas reforming reaction for synthesis gas operates at available gas pressure, thus saving 25-35% of power for subsequent compression of synthesis gas.	About 70% of gas feed converted to raw synthesis gas in reforming furnace, remainder in combustion furnace. Developed by M. W. Kellogg Co.

**FERTILIZERS AND FERTILIZER CHEMICALS (Continued)**

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Ammonia synthesis gas	Partial oxidation of methane	Spencer Chemical Co. .... Vicksburg, Miss.	210 ton/day plant using 95% oxygen for partial oxidation of natural gas to hydrogen and CO <sub>2</sub> . Latter is removed. 1,000 ton/day air separation plant supplies oxygen and nitrogen. Texaco process.	Started up January 1954. Liquid nitrogen from separation plant is used for scrubbing hydrogen, and in synthesis gas. Similar plants under construction elsewhere. Built by Foster Wheeler.
Ammonium nitrate	Continuous (Stengel)	Commercial Solvents Corp. Sterlington, La.	Ammonia and nitric acid react directly at 400 F. to yield molten nitrate, which is cooled on Sandvik steel belts, and then crushed. Eliminates evaporation and graining or prilling.	200 ton/day plant in operation.
Ammonium nitrate	Two-stage crystallization	Aburðarverksmiðjan H. F. Reykjavik, Iceland	Ammonia and nitric acid react with liberation of enough heat to evaporate all water. Evaporation is divided between two stages.	Plant in operation, 70 tons/day.
Fertiliser	Waste conversion	Chicago Stockyards Composting Co. Chicago, Ill.	Stockyard waste is aerated at 160 F. until dustfree and odorless. Product is 2-2-2 fertiliser.	\$250,000 plant in operation, capacity 3,500 tons/yr. Other similar operations on waste and garbage being considered in various cities.
Fertiliser, ammonium-phosphate-sulfate	Acidulation-ammoniation	Stauffer Chemical Co. .... Tacoma, Wash.	Pelleted product is 8-12-0 at present, containing 5-10% N, 10-15% phosphoric acid (90% water soluble).	Developed by Rumianca. Stauffer's 25,000 ton/yr. plant on stream Jan. 1954.
Fertiliser, mixed	Automatic	Naco Fertiliser Co. .... Ft. Pierce, Fla.	Complex, varied formulae batched by automatic scales, mixing equipment and conveyors.	Plant in operation.
Fertiliser, mixed	Granulation	Eastern States Farmers' Exchange Wilmington, Del.	Rotary dryer modified to serve also as granulator by removing flights from feed end. Pug mill serves as feeder. Product is uniform size, homogeneous.	Plant capacity, 15 tons/hr., in operation.
Fertiliser, nitrophosphate	Calcium nitrate conversion	Gewerkschaft Victor ..... Castrop-Rausel, Germany	Addition of small quantities of metallic salts such as Mg or Al permits high pH of ammoniated nitric-acidulated phosphate. This alkaline slurry can be treated with CO <sub>2</sub> to convert hygroscopic calcium nitrate to calcium carbonate.	Process developed in France by Potasse et Engrais Chimique. Offered in U. S. as successful solution to nitric acidulation problem by Chemical & Industrial Corp., Cincinnati.
Fertiliser, nitrophosphate	High-strength nitric acidulation	Lonsa Electric & Chemical Works Basle, Switzerland	Phosphate is acidulated with 68-75% nitric acid instead of usual 50%; no drying is required. Granulated product is powdered with hydrated lime and can be stored without caking.	Avoids need for ammoniation to overcome hygroscopicity of calcium nitrate.
Fertiliser, nitrophosphate	TVA	Illinois Farm Supply Co. Tuscola, Ill.	\$1,250,000 plant will use acid and ammonia from National Petrochemical.	Operation expected Jan. 1955; capacity to be 50,000 tons/yr.
Fertilisers, various	CO <sub>2</sub> blasting		Heaving action of expanding CO <sub>2</sub> released from a steel tube breaks up solidified storage piles. Safer than using dynamite.	Developed by Cardox Corp., Chicago.
Superphosphate	Ammoniation	Tennessee Valley Authority Wilson Dam, Ala.	Continuous ammoniator for superphosphate employs a rotating cylinder, with buried ammonia jets.	Pilot plant in operation.

**FINE ORGANICS**

Acetic anhydride	Acetone cracking	Courtaulds, Ltd. .... Coventry, England	Acetone derived from cheap petrochemical isopropyl alcohol is cracked to ketene which, dissolved in acetic acid, gives acetic anhydride.	Trick is to inhibit dehydrogenation of isopropyl in cracking by adding very small amounts of carbon bisulfide. Yields run over 80%.
Adipic acid	Synthetic		New process uses a 70% nitric acid, diluted down with polyhydroxylated compounds to 30%, to produce 90-95% pure adipic acid from cyclohexanol. Low temperatures are involved.	Laboratory-scale experiments developed by F. W. Brown of Clarkson College of Technology.
Alkaloids	Synthetic	T. & H. Smith, Ltd. .... Edinburgh, Scotland	Process starts with furane, which is converted to succinaldehyde. From there, atropine, homatropine and hyocyamine are made.	In production. Claimed process makes products conforming to same standards as those from natural sources. Winthrop-Stearns has related process for synthesizing atropine.
Amylose, amylopectin	Starch fractionation		Two new processes separate amylose from amylopectin. Basic process involves heating alkali-dispersed starch solution, pH below 11, at 50-60 C. Acid process works at pH of 5 or less.	Developed by Textile Research Inst. Offered to member firms.
Anthraquinone	From naphthoquinone	American Cyanamid Corp. Bound Brook, N. J.	Butadiene is added to 1,4-naphthoquinone, adduct is oxidized to anthraquinone.	Pilot plant in operation.
Aselaic acid	Molecular splitting	Kessler Chemical Co. .... Philadelphia, Pa.	Process involves molecular splitting of dihydroxystearic acid. Acid yields are greater and products are purer than previously possible with older commercial process.	May open new market for plentiful tallow
Aso dyes	Coupling with flavonone glucosides		Uses naringin and hesperidin, glucosides extracted from citrus peel.	Research by Florida Citrus Experiment Station, Lake Alfred, Fla.



# Picture of A CONTINUOUS WAY TO PROCESS HOT\* CHEMICALS

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Materials With  
Temperature Up  
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Here's a way to engineer efficient, continuous-cooling or conveying into your hot material processing.

Sandvik's steel-belt continuous coolers carry the material on a solid, endless, steel band of flat, stainless or carbon steel. This band "floats" on a patented water-bed arrangement which cools from beneath... no water gets on top of the band.

You can cool and convey, regulate thickness and graduate temperature while cooling, obtain desired sizes in the same operation, cool and strip off gelatinous materials in sheet form, cool loose and pulverized materials, cool solids in sheet form or crystallize liquids.

A steel belt provides a smooth, hard, impervious

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**ENGINEERING SERVICE**—Sandvik's engineering department will be glad to work with you in designing a conveyor to fit your operation. Sandvik has had over thirty years of experience in designing units to operate either as independent units or as integral parts of special processing equipment.

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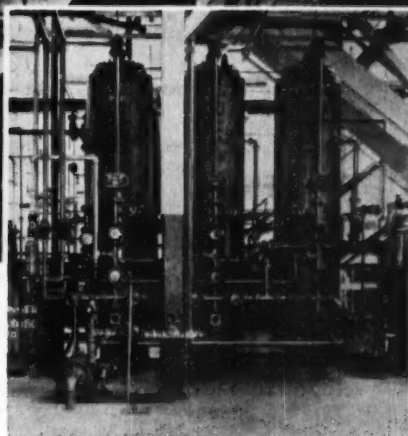
## FINE ORGANICS (Continued)

*PRODUCT	*PROCESS	*USER & LOCATION	*FEATURES	*STATUS & REMARKS
Chlorophyll.....	Lettuce cull extraction	Salinas Laboratories..... Salinas, Calif.	Lettuce culls are dried to meal, solvent extracted to get crude chlorophyll-containing oil. Carotenes, tocopherols and xanthophylls also extracted. Spent meal makes high-protein (22%) feed.	Extract is further processed by Collett-Week Corp., Ossining, N. Y.
Citramalic acid.....	From citric acid.....	Chas. Pfizer & Co..... Brooklyn, N. Y.	Citric acid reacted with $\text{NH}_4\text{OH}$ , then hydrolyzed. Product is drug and dye intermediate.	Made on pilot-plant scale.
Citric acid.....	Fermentation.....	Various..... Europe	Improved fermentation process gives high yield and wide feedstock flexibility. Operates on cane or beet molasses with addition of nutrients. Acid is recovered by precipitation as calcium citrate.	Process developed by Noury & Vander Lande, in Holland, offered by Scientific Design Co. Dutch plant available for demonstration and operator training.
Cobalt naphthenate.....	Direct metal reduction	Nuodex..... Elizabeth, N. J.	Naphthenic acid and powdered cobalt react directly at 190 F. in presence of air and water.	In production.
Corticosterone, 17-hydroxy.....	Fermentation.....	Upjohn, Co..... Kalamazoo, Mich.	Process requires 15 steps, beginning with a mold containing progesterone. Overall yield is 15%.	Synthesis is in laboratory stage.
Cortisone.....	Total synthesis.....	Monsanto Chemical Co..... St. Louis, Mo.	Process based on toluene as starting material. Fewer steps and better yields than earlier syntheses.	Still in experimental stage. \$18.4-million certificate of necessity in hand, no plant plans yet announced.
Dextran.....	Enzymatic synthesis	.....	Enzymes are used to form high molecular weight polymer from sucrose. This eliminates a hydrolysis step.	Developed by USDA.
Dextrose.....	Wood hydrolysis.....	Rheinau Co..... Regensburg, Germany	Produces crystallized dextrose from wood chips, via three-stage, selective hydrolysis with varying concentrations of hydrochloric acid followed by ion-exchange demineralization. Process claimed able to compete with dextrose from corn in U. S.	Process in pilot plant. Available for licensing through Karl Schoenemann, Heidelberg, Germany.
o-Dichlorobenzene.....	Distillation.....	Allied Chemical & Dye..... Corp. Syracuse, N. Y.	Pure ortho is separated from other isomers by fractional distillation, with caustic and ammonia present to neutralize and inhibit corrosive action produced by impurities.	In pilot-plant operation.
Dimethyl terephthalate.....	Air oxidation.....	Hercules Powder Co..... Burlington, N. J.	Para-xylene is air-oxidized to toluic acid, esterified with methanol to methyl para-toluate, oxidized further to monomethyl terephthalate, finally esterified to DMT.	\$4-million plant under construction for May 1955. Capacity: 12 million lb./yr. for ICI Terylene plant at Milhaven, Ont.
Diphenyl mercury.....	.....	Gallowhur Chemical Corp. Ossining, N. Y.	Series of ionic reactions gives 80-90% yield. Avoids expensive reagents, no separation problems.	Lab. scale. Could make product at \$20/lb. on commercial scale.
Fatty alcohols.....	Reduction.....	.....	Metallic sodium is dispersed in an inert solvent; a mixture of fatty compounds and a reducing alcohol is added. Two phases result. The solvent is removed, leaving fatty alcohol. No high pressure equipment or catalysts are needed in the process.	Developed by Ethyl Corp.
Fatty alcohols.....	Sodium reduction.....	Stepan Chemical Co..... Chicago, Ill.	Tallow, methyl isobutylcarbinol and toluene react with dispersion of sodium in toluene to release glycerine. Solvents are recovered, fatty alcohol mixture purified by distillation.	1.5-million lb./yr. semiworks started early 1953, giving 85-90% yields.
Furfural.....	From waste sulfite liquor	Brown Co..... Berlin, N. H.	Exploring possibility of economic recovery of furfural.	Pilot plant in operation. If feasible, Brown plans large furfural plant.
Gamma globulin.....	Blood separation.....	Armour & Co..... Kankakee, Ill., Ft. Worth, Tex.	Process depends on close control of temperature and concentrations. Blood is centrifuged; then plasma is treated with alcohol and buffers in five precipitation steps.	Process is in use.
Higher alcohols.....	Sodium reduction.....	Archer-Daniels-Midland... Ashtabula, Ohio	Will process linseed, soybean and marine oils by improved sodium reduction process to produce higher alcohols of high purity.	Plant operation scheduled for June 1954.
Isophthalic acid.....	.....	Oronite Chemical Co..... Richmond, Calif.	Will build first commercial plant to make this chemical intermediate — up to 50 million lb./yr.	Plant operation scheduled for mid-1955.
Lactic acid.....	Alkaline degradation.....	.....	Alkaline degradation of molasses reduces reaction time to minutes as compared to hours involved in fermentation process. Crude product is purified by solvent extraction.	Developed by USDA.
Levulose.....	.....	Pfanstiehl Chemical Co.... Waukegan, Ill.	Details not given. Said to be an improvement over classical method of fractional crystallization of calcium complexes.	In pilot-scale use.
Lyxine.....	Synthetic.....	E. I. du Pont de Nemours & Co. Niagara Falls, N. Y.	Synthetic process using furfural. Details not available.	Pilot-plant in operation.

# How BEECH AIRCRAFT will save \$10,000 a year in Plating and Anodizing



Permutit Ion Exchangers also eliminate waste disposal problem...improve resistance to corrosion of anodized coatings.



Beech Aircraft encountered a tough chromate disposal problem. Dumped portions of Beech's 5%  $\text{CrO}_3$  anodizing baths plus the rinse flow were sending more than 70 pounds of  $\text{CrO}_3$  per day to waste. Immediate action was necessary!

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**New Method Investigated!** Beech engineers looked into the ion exchange process of chromate treat-

ment pioneered by Permutit. Here's what they got with Permutit's help.

**Chromic Acid Savings!** Compact Permutit units (above) eliminate pollution. It is no longer necessary to dump any portion of the anodizing baths! The cation exchange unit removes contaminating dissolved aluminum, permits indefinite re-use of the chromic acid.

**Improved Corrosion Resistance!** The two anion exchange units recover up to 40 lbs. of  $\text{CrO}_3$  per day from rinse water. All water is recir-

culated! It goes back to rinse tanks *mineral-free*, at the correct pH for best resistance to corrosion of the anodized coat.

It's easy to see how this Permutit installation will pay for itself in less than 2 years... and why you should let Permutit help you solve your waste disposal problem.

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## PERMUTIT



## FINE ORGANICS (Continued)

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Mercuric acetate . . . . .	Direct . . . . .	Buffalo Electro-Chemical Co. . . . . Buffalo, N. Y.	Product usually made from mercury salt owing to poor reactivity of metal. New process reacts metal with special pure peracetic acid in glacial acetic acid medium.	Reduces cost, gives close to theoretical yield.
Mesitylene . . . . .	Cracking acetone . . . . .	Univ. of Texas . . . . . Austin, Tex.	Continuous flow preparation of mesitylene by catalytic condensation of acetone gives 21.3% yield. Uses natural bauxite catalyst.	Experimental process.
Methyl and dimethyl styrenes	Cracking of diaryl ethanes	American Cyanamid Co. . . . . Stamford, Conn.	Toluene or xylene is reacted with acetylene or acetaldehyde; resulting diaryl ethane is catalytically cracked to yield substituted styrene plus toluene or xylene.	Under pilot-plant investigation.
Methyl mercaptan . . . . .		Thiochemicals, Inc. . . . . Port Arthur, Tex.	Product will be made from hydrogen sulfide derived from waste refinery gases. Previously it has been extracted from crude oil.	New \$500,000 plant will get gas from Atlantic Refining Co. Product to be used to make methionine.
Methyl taurine . . . . .	Continuous . . . . .	General Aniline & Film Corp. . . . . Linden, N. J.	Sodium isethionate and methyl amine are fed continuously into reactor at elevated temperature and pressure. Product goes to evaporator for removal of water and unreacted amine.	In operation as part of detergent manufacture.
Nonyl phenol . . . . .		Jefferson Chemical Co. . . . . Port Neches, Tex.	New process, details not available.	Commercial unit in operation.
o-Phenanthroline . . . . .	Synthetic . . . . .	R. T. Vanderbilt Co. . . . .	Compound is synthesized via a series of difficult reactions.	Product, being made on pilot-plant scale, is a nonmetallic drying agent for paints and inks.
Pinane hyperperoxide	From gum turpentine	USDA . . . . . Olathe, Fla.	Improved, economical method <sup>1</sup> is claimed for production of pinane hyperperoxide from gum turpentine.	Announced January 1954.
Potassium acid saccharate	Nitric acid oxidation of dextrose		4-hr. oxidation at acid-dextrose ratio of 3 to 4 gives 43% yield of 98 to 99% pure saccharate.	Developed by USDA, Northern Regional Research Lab. Pilot plant successful.
Pyridines . . . . .	Synthetic . . . . .	Ansul Chemical Co. . . . . Marinette, Wis.	Process makes gamma-picoline, alpha-picoline, 2-methyl 5-ethyl pyridine, lutidines and collidines.	Pilot plant in operation, semicommercial unit planned for 500,000 lb./yr.
Pyridines . . . . .	Synthetic . . . . .	Reilly Tar & Chemical Co. . . . . Indianapolis, Ind.	Acetylene and NH <sub>3</sub> react to form pyridine, as well as alpha, beta and gamma-picoline.	Plant in operation; capacity 4 million lb./yr.
Saccharin . . . . .	From phthalic anhydride	Maumee Chemical Co. . . . . Toledo, Ohio	New route from phthalic anhydride gives no byproducts. Is source for phthalimide, anthranilic acid, dithiodibenzoic acid and its methyl ester, which are intermediates in this process.	In commercial production.
Sorbic acid . . . . .	Synthetic . . . . .	Union Carbide & Carbon Corp. . . . .	Used as an antimold agent in cheese, meat, pickles, and other foods.	UCC is considering building a new plant.
Tetracycline . . . . .	Fermentation . . . . .	Bristol-Myers Co. . . . .	New fermentation process developed for manufacture of tetracycline.	Announced Nov. 1953.
Trifluoroacetic anhydride	Dehydration . . . . .	Minnesota Mining & Mfg. Co. . . . . St. Paul, Minn.	As catalyst for esterification, TFA anhydride goes to the acid. Anhydride can be recovered by reacting acid with stabilized sulfur trioxide.	
Vaccine . . . . .	Sound wave treatment	Sharp & Dohme . . . . . Philadelphia, Pa.	Process makes whooping cough vaccine by disintegrating whooping cough germs with high-frequency sound waves.	
Vitamin B-12 . . . . .	From sewage . . . . .	Milwaukee Sewerage Commission . . . . . Milwaukee, Wis.	Vitamin B-12 concentrate, suitable for animal and poultry feeds, is extracted from dried sewage countercurrently with water.	Pilot plant in operation, market studies underway. Developed by V. E. Alden Co., Chicago.
Wax . . . . .	Extraction . . . . .	Soya Co. . . . . Wilson, Ark.	Process to be operated on pilot scale to study removal of high quality wax, tanning agents and other products from Douglas fir bark.	M. W. Kellogg Co. optioned process from Oregon Forest Products Laboratory.

## HEAVY ORGANICS

Acetic acid and anhydride	Butane oxidation . . . . .	Celanese Corp. of America . . . . . Pampa, Tex.	Compressed air is used for catalytic oxidation of normal butane at higher pressures and lower temperatures than used at Celanese Bishop plant. Formaldehyde is not a product.	First units of commercial plant are in operation. Capacity 1.8 million lb./week of acid. Makes wide use of sieve-plate towers and air-cooled exchangers.
Acetylene . . . . .	Solvent concentration		Process concentrates acetylene (in concentration of 8-15% as made from natural gas or methane) by using dimethyl formamide as a selective solvent. A high purity, 90% acetylene, can be produced.	Developed by researchers at the Univ. of Texas.



HEAVY ORGANICS (Continued)

*PRODUCT	*PROCESS	*USER & LOCATION	*FEATURES	*STATUS & REMARKS
Adipic acid.....		Allied Chemical & Dye Corp. Hopewell, Va.	New process will be used, presumably related to production of caprolactam.	Will be used in Allied's production of nylon, possibly also for adipic esters.
Algae animal feed....	Photochemical.....	Univ. of California..... Richmond, Calif.	Pilot plant testing process of converting city sewage to high-protein green algae. After two days algae growth is maximum.	Yield of algae is about 1,000 lb. per million gal. of sewage. Product is centrifuged, pasteurized and dried for feed.
Benzene hexachloride	Continuous.....	Pennsylvania Salt Mfg. Co. Calvert City, Ky.	New more efficient continuous process.	Construction underway for operation in 1954.
Chemical cotton	Continuous digestion	Hercules Powder Co..... Hopewell, Va.	Digestion carried out continuously on moist fibers rather than slurry of fibers. Gives higher yield, less space, lower operating cost, much shorter time.	Process working at 300 ton/day rate, giving better uniformity than batch process.
Coke.....	Contact coking.....	Pittsburgh Consolidation Coal Co. Liberty, Pa.	Moving bed process works with bituminous coal and petroleum feed stock. Applications seen in other fields.	
p-Cresol.....	Synthetic (ex toluene).....	Sherwin-Williams Co..... Chicago, Ill.	Conventional process improved by substituting byproduct sodium sulfite for sodium carbonate as neutralizing agent and using sulfur dioxide so produced to release p-cresol from sod. p-cresolate.	Improved process put into use early 1953. Est. 2-4 million lb./yr.
Detergents.....	From tallow.....	General Aniline & Film Corp. Linden, N. J.	Tallow acids are converted to acid chlorides, reacted with methyl taurine and caustic. Improved process for methyl taurine is significant.	In production.
Formaldehyde.....	Vapor-phase oxidation	Reichhold Chemicals, Inc., Seattle, Wash. (and elsewhere)	Methanol oxidation process substitutes mixture of metal oxides for usual silver catalyst, gets 95% yield compared with usual 85-88%. No rectification or stripping needed.	Seattle plant operating; others to be built. Simpler equipment means much lower plant cost. Estimated output 120 tons/day in 1954.
Fuels.....	Coal hydrogenation.....		A one-step coal hydrogenation process for making fuels. Carried out at 500-525 C. and high pressures, in the presence of nickel, tin or molybdenum catalyst. The result is a distillable oil, without coke or asphaltene formation.	Developed by Natural Bureau of Standards. Bench-scale status.
Glue.....	Continuous.....	Swift & Co..... Chicago, Ill.	Improved appearance, odor and performance due to closely controlled continuous process.	Now operating.
Hydrocarbon sulfonates	Alkylation-sulfonation	Universal Detergents, Inc., Los Angeles, Calif.	Aromatic petroleum derivatives are alkylated and sulfonated in a single step.	In commercial operation, 25 tons/day.
Leather.....	Secotan.....	Eagle Ottawa Leather Co., Grand Haven, Mich.	Completely automatic machine tans leather in minutes, compared with weeks or months of conventional methods.	Being tested commercially.
Maleic anhydride....	Solvent absorption.....		Anhydride is recovered from converter gases by absorption in dibutyl phthalate, followed by reduced-pressure distillation. Equipment can be used interchangeably for phthalic anhydride production.	Plant underway in Europe. Process developed by Scientific Design Co., New York.
Methanol.....	Synthetic.....	Heyden Chemical Corp. & Monsanto Chemical Co. Texas City, Tex.	Off-gas from Monsanto's natural-gas-based acetylene plant is starting material.	Commercial production at 25 million gal./yr. expected in 1955. Plant will be jointly owned, output divided.
Oxygenated chemicals	Modified Fischer-Tropsch		Synthesis gas is bubbled through a slurry of nitrided iron catalyst. Yield of oxygenated chemicals is several times that obtained with reduced iron catalyst.	Developed by U. S. Bureau of Mines.
Phenol.....	Cumene oxidation..	B. A. Shawinigan, Ltd., Montreal, Que.	Cumene (from benzene and propylene) is oxidized to cumene hydroperoxide, which then splits to phenol and acetone. Hercules process.	First plant to use this process now operating. Capacity 13 MM lb./yr. phenol. Several other companies are building similar plants. Oronite Chemical Co. started spring 1954, rated at 35 MM lb./yr.
Starch, oxidized....	Electrolytic.....	Aktiengesellschaft A. Hering Nurnberg, Germany	Water slurry of starch with 5% NaCl is electrolyzed in diaphragmless cell producing NaOCl which decomposes, producing nascent oxygen.	Process pilot-planted.
styrene oxide.....	Continuous.....	Dow Chemical Co..... Freeport, Tex.	Continuous process, using low-cost raw materials, produces a high-quality product. Probably involves styrene chlorohydrin as intermediate.	Semicommercial unit in operation, producing more than 10,000 lb./mo.
Trichlorethylene....	Tetrachlorethane pyrolysis	Hooker-Detrex Corp., Ashtabula, Ohio	Tetrachlorethane is thermally decomposed, yielding HCl as coproduct.	Existing plant being converted to new process. HCl will be piped to General Tire & Rubber to make vinyl chloride.
Trinitrotoluene.....	Continuous.....		Process reduces hazards of TNT production. Only 1/25 as much explosive present in process at any one time as in a batch plant of the same daily capacity.	Developed by J. Meissner in Germany.

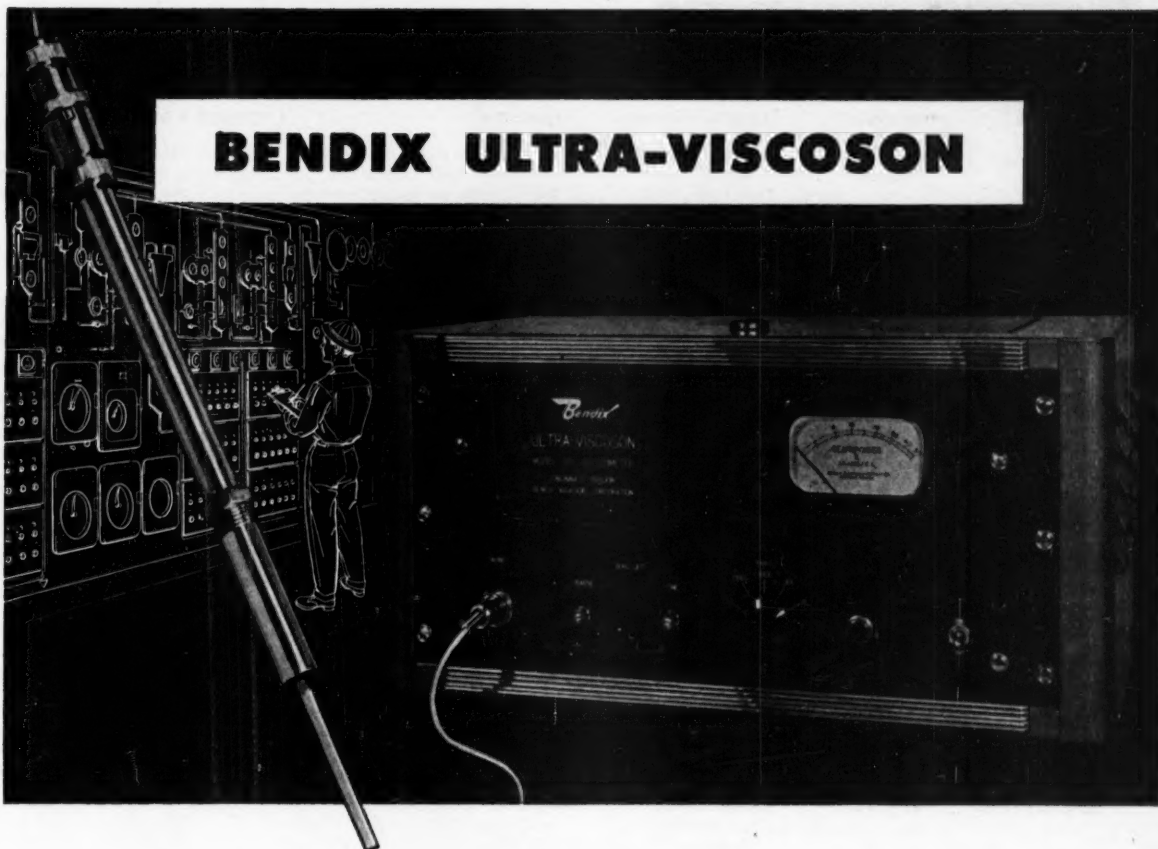
## HEAVY ORGANICS (Continued)

• PRODUCT	• PROCESS	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Urea.....	Montecatini.....	.....	Mild reaction conditions and proper construction materials minimize corrosion problems. $\text{NH}_3$ and carbamate are partially recycled in liquid form. Conversions are 70% on $\text{NH}_3$ and 80% on $\text{CO}_2$ .	Developed in Italy, available in U. S. through M. W. Kellogg Co.
Urea.....	Chemico.....	Sumitomo Chemical Co., Niigata, Japan	Excess $\text{NH}_3$ is separated as gas, condensed without compression and recycled by pumping. Conversion is 76% per pass, over-all $\text{NH}_3$ efficiency 97%. Special granulator produces uniform spherical pellets.	Process available through Chemical Construction Corp. Japanese plant in operation.
Vinyl acetate.....	Acetylene-idea.....	Celanese Corp. of America, Pampa, Tex.	New process, details not disclosed. Uses no acetylene.	Plant in operation, capacity 30 million lb./yr.
Vinyl chloride.....	Catalytic.....	.....	A complex salt of mercury and barium chloride is used to catalyze reaction of acetylene and $\text{HCl}$ to vinyl chloride. Process can use a gas containing only 10% acetylene.	Developed by Univ. of Texas. Process only bench scale so far.
p-Xylene.....	Continuous fractional crystallization	Phillips Chemical Co. and Cosden Petroleum Corp., Big Spring, Tex.	Continuous process developed by Phillips is first to make 98% pure or better p-xylene in commercial quantities.	5-million lb./yr. plant now supplying tankcar quantities to Du Pont at Gibbstown, N. J., for oxidation to terephthalic acid.
p-Xylene.....	Hydroforming.....	Standard Oil Co. (Ind.), Whiting, Ind.	Certain petroleum fractions will be converted to mixed aromatics by hydroforming. Mixture will be separated to recover p-xylene and benzene.	Plant being built for Jan. 1955 operation will produce 14 million lb./yr.
p-Xylene.....	Low-temperature recrystallization	Humble Oil & Refining Co., Baytown, Tex.	Mixed xylenes are crystallized at $-95^\circ\text{F}$ ., recrystallized at $0^\circ\text{F}$ ., using scraped-surface heat exchangers.	Plant in operation. Supplies p-xylene to Du Pont for Dacron via terephthalic acid.

## INORGANICS

Alumina.....	Electrolytic.....	.....	Continuous electrolytic process is claimed to produce high-purity alumina from low-grade kaolin clays containing as little as 6 to 10% alumina. Power consumption is claimed to be less than 2 kwh./lb.	Developed in Europe, process is available in U. S. through Lobeth Corp., Chicago.
Alumina.....	From anorthosite...	U. S. Bureau of Mines, Laramie, Wyo.	Anorthosite (aluminum silicate) is sintered with limestone to yield alumina and portland cement base.	Experimental plant in operation.
Alumina trihydrate...	Combination Bayer-sinter	Reynolds Metals Co., Louisville, Ky.	Organic-free product is made from sodium aluminate produced by dry reaction at elevated temperature to burn away organic material. Then organic-free hydrate is precipitated.	New product can be used to make white aluminum chemicals, e.g., iron-free alum.
Beryllium chloride...	Sheer-Korman.....	Light Metals Refining Co., New York, N. Y.	Process uses high intensity arc, first used in military searchlights, for temperature of 15-20,000 F. (o.f., 6,000 F. for normal arc). Electrodes are carbon and beryl ore, operating in chlorine atmosphere.	Power needs are low, i.e., 3-6 kwh./lb. $\text{BeCl}_2$ . Process applicable for other metal chlorides and possibly also for aluminum metal, acetylene and nitric acid.
Carbon, activated...	Continuous.....	Girdler Corp., Louisville, Ky.	Continuous process replaces older batch process, producing a more uniform product.	Plant in operation
Carbon bisulfide.....	Methane-sulfur.....	Food Machinery & Chemical Corp., Charleston, W. Va.	Reaction between methane and sulfur takes place in radiation-type furnaces.	Plant in operation, first to use this process.
Cement, portland....	Viscosity control...	Missouri Portland Cement Co., St. Louis, Mo.	0.15% sodium tripolyphosphate deflocculates shale slurry, cuts water content, makes slurry pumpable. Also increases plant output, as well as saving fuel.	Used in 2,300 bbl./day operation.
Cement, portland....	Naphtha slurry.....	.....	High-boiling naphthas used instead of water in conventional wet process; reduces fuel needs; other advantages are also claimed.	Developed in Sinclair Oil Corp. laboratories; ready for commercialization.
Chlorine.....	Direct-contact cooling	Velsicol Corp., Memphis, Tenn.	New system for-cooling chlorine cell gas is to pass it up a packed tower against first 70 F. well water, then 50 F. chilled water.	Off-gas is dried with sulfuric and liquefied. Off-water is stripped of chlorine with steam.
Chlorine dioxide.....	From sodium chlorate	Riegel-Carolina Corp., Acme, N. C.	Sodium chlorate is reduced in acid solution. Process is efficient, and economical.	Developed by Allied Chemical's Solvay Process Div., now in commercial operation.
Chlorine dioxide.....	$\text{SO}_2$ reduction.....	Pennsylvania Salt Mfg. Co.	Produced by reducing sodium chlorate with sulfur dioxide. Acid use is low, chlorate efficiency high, process control easy.	Experimental.
Dolomite.....	Heavy-media separation	Kaiser Aluminum & Chemical Corp., Natividad, Calif.	Sink-float unit upgrades dolomite by reducing its silica content. Heavy medium is ferrosilicon-magnetite.	200 ton/hr. plant in operation.

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## INORGANICS (Continued)

• PRODUCT	• PROCESS	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Fluorine disposal...	Steam reaction, continuous	Union Carbide & Carbon-AEC Oak Ridge, Tenn.	Fluorine is preheated and reacted with superheated steam to form HF. Extremely exothermic reaction is now controllable by cooling the walls of the reactor.	Although violent explosions have been reported in literature, none have occurred in pilot plant. Monel construction is recommended.
Fritted trace elements	Fusion.....	Ferro Corp..... Cleveland, Ohio	Produces slowly soluble "glass" frit containing trace elements: Mn, Fe, Zn, Cu, B, Mo, for use as soil additive.	Claimed to leach slowly and give full year's supply of trace elements to supplement usual fertilizers.
Glass.....	Electric melting....	Northwestern Glass Co.... Seattle, Wash.	Older process used carbon electrodes, could make only amber glass. New molybdenum electrodes last much longer. They permit flint glass also to be made.	Electric furnace improves glass quality, requires lower capital investment, takes less maintenance than oil or gas-fired furnaces.
Hydrazine.....	Modified Raschig...	Matholin Corp..... Lake Charles, La.	Sodium hypochlorite and $\text{NH}_3$ react to form chloramine, which reacts with more $\text{NH}_3$ to form hydrazine. Dilute solution (2%) is concentrated by azeotropic distillation.	\$3-million plant in operation, first large-scale installation in U. S. Owned jointly by Mathieson Chemical and Olin Industries.
Hydrochloric acid, a.p.	Hydrazine dechlorination	.....	Hydrazine hydrate is added to HCl in storage tank or tank car in proportion to free chlorine present to form HCl and nitrogen.	Developed by Mathieson Chemical Corp. Expected to be useful also for purifying other halogen acids.
Hydrochloric acid recovery	Reduction-oxidation	Tin Processing Corp..... Texas City, Tex.	Waste from tin leaching, principally iron chloride and free HCl, is reduced to ferrous chloride with iron turnings, then roasted to yield HCl and saleable iron oxide.	Process solves serious waste disposal problem, recovers 600,000 gal. of 31¼% HCl per month.
Hydrogen peroxide...	Nonelectrolytic.....	Allied Chemical & Dye Corp., Solvay Div.	Process involves chemical oxidation reaction. No details available.	New plant, announced May 1954, to be built on site of present plant, location unspecified.
Hydrogen peroxide...	Non-electrolytic....	E. I. du Pont de Nemours & Co. Memphis, Tenn.	Alkylated anthraquinones are reduced, then oxidized with oxygen; peroxide is separated by solvent extraction.	First plant based on this process now in commercial operation. Buffalo Electro-Chemical Co. is pilot-planting similar process, others such as Penn Salt and Mathieson are considering.
Manganese dioxide...	Electrolytic.....	Western Electrochemical Co. Henderson, Nev.	Ore leached with sulfuric, solution purified with barium sulfide and aeration. New cells feature low current density and labor requirement.	10 ton/day plant now in operation.
Mica.....	Synthetic.....	Mycalex Corp. of America. Clifton, N. J. Brush Beryllium Co. Cleveland, Ohio	Ingredients (oxides, fluoride, etc.) are melted in electric furnace, melt is cooled, crushed.	Original process developed by Bureau of Mines. Commercial modifications now in use.
Ore beneficiation.....	Electrostatic (T)....	International Minerals & Chemical Corp. Carlsbad, N. M. (also in Florida, Conn.)	Ore is ground, dried, passed between separating electrodes; useful on potash ores, phosphates, feldspar, etc.	Le Baron-Lawver process pilot-planted in Florida. Commercial plants planned for feldspar (Conn.), potash (N. Mex.).
Oxygen.....	Low pressure.....	U. S. Air Force.....	Portable generator for 95-99.6% oxygen can be transported by air and set up in 80 hr. Uses reversing exchangers and turbo-expander.	Developed for Air Force by Arthur D. Little, Inc. Maximum pressure is 91 psig. Expected to produce 1.91 lb. liquid oxygen/lb. fuel.
Phosphoric acid.....	Prayon process.....	Smith-Douglas Co..... Streator, Ill.	Guaranteed yield is 95% of $\text{P}_2\text{O}_5$ entering. Leach temperature is controlled by evaporative cooling. Special horizontal rotary tray filter removes byproduct gypsum with minimum washing losses.	Developed in Belgium, Prayon process is engineered and installed in U. S. by Singmaster & Breyer. Claim 32% acid from sulfuric of only 85%.
Phosphoric acid.....	Vacuum concentration	Western Phosphates, Inc.... Garfield, Utah	Acid concentrated in falling film evaporator at vacuum of about 10 mm. Hg.	Concentrator developed by Carrier Corp.
Phosphoric anhydride	Phosphorus oxidation	Virginia-Carolina Chemical Corp. Charleston, S. C.	Metered stream of molten phosphorus is burned in dry air. Phosphoric anhydride (anhydrous $\text{P}_2\text{O}_5$ ) is condensed in "barns."	Plant in operation.
Phosphorus pentasulfide	.....	Victor Chemical Works....	New process, involving distillation, makes light-colored product, used largely in oil additives.	In production.
Potassium nitrate....	Extraction from seawater	Norsk Hydro, Mekog..... Ijmuiden, Holland	Dipicryl amine reacts with K salts to form a precipitate, which is filtered out and dissolved with nitric acid to form $\text{KNO}_3$ and regenerate amine.	Pilot plant will make 1,650 tons/yr.
Potassium sulfate....	Modified Hargreaves	Potash Co. of America.... Dumas, Tex.	Briquetted KCl is treated countercurrently in chambers with $\text{SO}_2$ , air and water vapor, producing product with less than 2% chloride. Recovery exceeds 95%.	Byproduct HCl is recovered as 20 Be. solution for oil well acidizing.
Rare earths.....	Countercurrent extraction	Oak Ridge National Laboratory Oak Ridge, Tenn.	Glass countercurrent extraction column handles sufficient throughput for production of appreciable quantities of lanthanide rare earths.	Project well along.
Salt.....	Fluidised drying....	Caray Salt Co..... Hutchinson, Kan.	Salt is dried at 5 tons/hr. from initial 3% to 0.03% moisture in fluidised bed by hot gas from burning natural gas. Fluidised cooling follows drying.	Dryer developed by Combustion Engineering. Report fuel cost saving of two-thirds compared with kiln drying. Labor is reduced, power is said to be no higher.



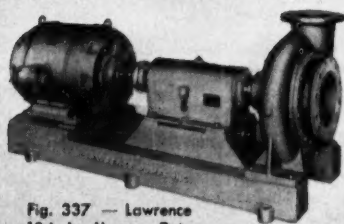


Fig. 337 — Lawrence 10-inch Heavy Duty Stainless Steel Chemical Pump.

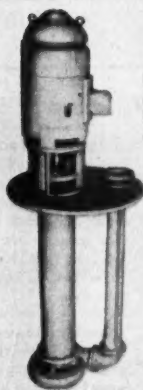


Fig. 279 — Lawrence 8-inch Vertical Pump for handling molten salts at 850°F.

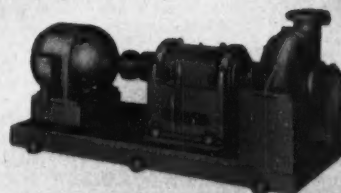


Fig. 343 — Lawrence Steam-Jacketed Chemical Pump with water-cooled bearings.

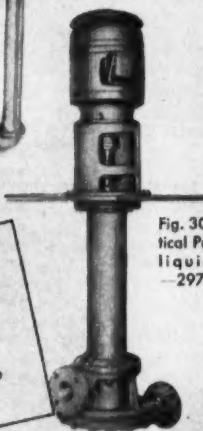
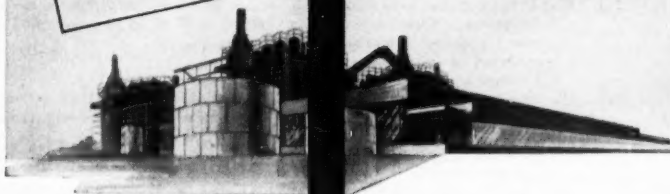


Fig. 307 — 2-inch Vertical Pump for handling liquid oxygen at -297°F.



Fig. 333 — 24-inch Horizontal Circulating Propeller Pump of Nickel Alloy Construction.

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## INORGANICS (Continued)

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Silica.....	Combustion of $\text{SiCl}_4$	Dow-Corning Corp. .... Midland, Mich.	Dow-Corning will produce fine silica powders in 4-25 millimicron range by German Degussa process, burning vaporized $\text{SiCl}_4$ and hydrogen in air.	Dow to make 30 tons/month. Godfrey L. Cabot likely to build similar plant.
Silicon chlorides.....	Catalytic.....		Chlorine and silicon react with a catalyst fast enough, below ignition temperature, to form higher chlorides (e.g., hexachloride), depress tetrachloride formation.	Developed by National Research Council of Canada. Available through Canadian Patents & Development Ltd.
Soda ash.....	From trona.....	Intermountain Chemical Co. .... Westvaco, Wyo.	Solid trona is mined underground, brought to surface, processed to soda ash by crushing, dissolving, removing impurities, evaporating, crystallizing, centrifuging and calcining.	\$18-million plant in operation. Capacity 300,000 tons/yr.
Soda ash.....	Wet handling.....	Union Bag & Paper Corp. Savannah, Ga.	Bulk soda ash is handled and stored as a solution or slurry. Eliminates dusting problems.	Facilities installed late 1953. Method developed in cooperation with Mathieson Chemical Corp.
Sodium silicate.....	Cowles.....	Davison Chemical Corp. .... Lake Charles, La.	Newly patented process continuously reacts mixture of soda ash and sand in furnace with molten sodium silicate. Part of process for making cracking catalyst.	Developed by Cowles Chemical Co., Davison is only licensee. Gives higher purity, lower maintenance costs. Plant capacity 300 tons/day.
Sulfur.....	Autoclave.....	Texas International Sulphur Co. San Felipe, Baja California, Mex.	Claimed to be first mine in North America to produce commercial sulfur from surface ore.	Plant operating spring 1954.
Sulfur, $\text{SO}_2$ .....	Desulfurizing anhydrite	Imperial Chem. Industries Billingham, Eng.		Full-scale retort planned.
Sulfur.....	Solidification.....	Petroleos Mexicanos ..... Pasa Rica, Mex.	Molten sulfur is solidified on water-borne stainless steel conveyor belt. Replaces cooling vats.	Cooling belt by Sandvik Steel Corp. Product handles easily, weathers better than crushed sulfur.
Sulfuric acid.....	Kachkaroff-Guareschi	Mid-western U. S. ....	First U. S. installation to be made of this Italian process. A tower type nitration process, it claims a reaction space requirement of only 0.12 cu. ft./lb. sulfur/day.	Makes 60 Bc. acid at 99.9% conversion. Offered in U. S. by International Processes, Inc.
Sulfuric acid.....	Fume scrubbing....	Mathieson Chemical Corp. Pasadena, Tex.	$\text{SO}_2$ fumes are removed from waste gases in double scrubbing system using ammonium sulfite-bisulfite solution. First scrubber operates at low pH, second at higher pH.	\$340,000 unit has solved air pollution problem of 500 ton/day sulfuric acid plant.
Sulfuric acid.....	From refinery sludges	Consolidated Chemical Industries ..... Baton Rouge, La.	Spent acid as weak as 65% is sprayed into combustion furnace. Gases are scrubbed, cooled, dried, then fed to contact converter. Over-all yield on spent acid is 94%.	400 ton/day plant in operation. Handles wide variety of sludges from Esso refinery. Built by Chemicon.
Sulfuric acid recovery	Ruthner.....	Various..... Europe	Recovers entire sulfate equivalent of waste pickle liquors as sulfuric acid. Ferrous sulfate after evaporation converted to ferrous chloride and removed by centrifuging. HCl is regenerated and recycled.	Process developed in Austria. Available in U. S. through Blaw-Knox Co.
Water, purified.....	Compression distillation	Badger Mfg. Co..... Boston, Mass.	Dept. of Interior signed \$80,000 research contract with Badger to develop process for converting salt water to potable water via use of recompression evaporation.	Announced April 1954.

## Your Inventory of New Processes and Technology

## What It Contains . . .

This inventory lists some 294 new processes and technology advances announced or commercialized during 1953 and the first half of 1954. For previous developments, consult CE's tabulations published February 1951, 1952, 1953, January 1954.

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INORGANICS (Continued)

• PRODUCT	• PROCESS	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Water, purified .....	Electro-membrane ion exchange	Ionics, Inc. .... Cambridge, Mass. Rohm & Haas Phila., Pa.	Membrane materials have been developed which will selectively pass cations in the presence of anions, or vice versa.	High cost now; expected eventually to be one of the more efficient processes for water de-salting.
Water, purified .....	Metal salts .....	Salem-Brosius .....	New metal-salt water purification method claimed to kill bacteria and eliminate bad odors and tastes.	
Zirconium oxide .....	Limestone .....	Zirconium Corp. of America Solon, Ohio	Process involves use of limestone to separate Zr values from beach sand.	\$200,000 plant in operation; capacity 3 tons/day.
Zirconium tetrachloride .....	Direct chlorination .....	U. S. Bureau of Mines .... Albany, Ore.	Process uses direct chlorination of purified zirconium oxide rather than older, more wasteful process of chlorinating the carbide.	This process an intermediate step in making zirconium metal for AEC. Similar process used by Carborundum Metal Co. at Akron, N. Y.

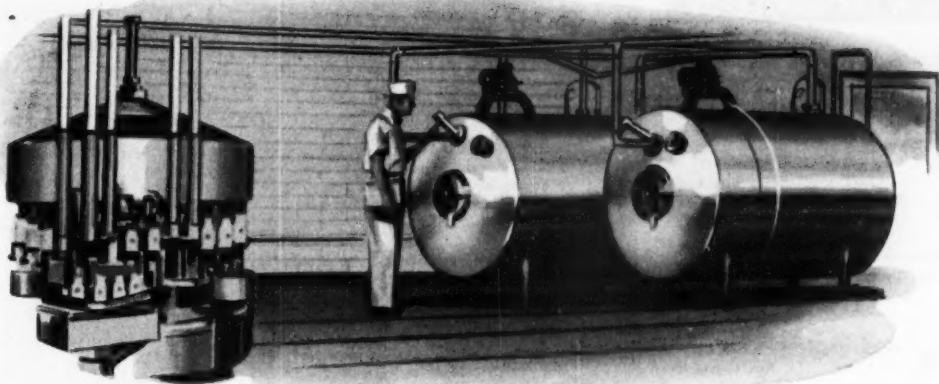
METALS

Aluminum .....	Electrolytic .....	Anaconda Aluminum Co. . Kalispell, Mont.	Cells will use new vertical-spike Soderberg electrodes. Maintenance costs are markedly reduced, cryolite recovery increased.	Plant under construction. Electrode design by Elektrokemisk A/S, Oslo.
Aluminum .....	Electrolytic .....	Reynolds Metals Co. .... Corpus Christi, Tex.	Giant cells, largest in the industry, are reported to be designed for 105,000 amp., 2-3 times conventional currents. Power consumption is probably less than with smaller cells.	\$80-million plant in operation.
Boron .....	Electrolytic .....	Cooper Metallurgical Associates Cleveland, Ohio	Electrolytic cell uses graphite anode and low-carbon iron plate cathode. Fused batch consists of potassium chloride or fluoride, potassium fluoroborate and boron oxide.	Produces 99% pure boron.
Ferrochrome .....	Simplex .....	Electro Metallurgical Co. . Marietta, Ohio	High-carbon ferrochrome is reduced in carbon content to less than 0.025% by high-vacuum furnacing with silica. Product goes into ELC stainless steels.	Plant in operation. Vacuum is produced by steam-jet system of record size.
Ferronickel .....	Ugine .....	Hanna Nickel Smelting Co. Riddle, Ore.	Process makes ferronickel directly from nickel silicate. "Hogged" waste wood mixed with ore charged to electric arc furnace gives more porous charge, better temperature control, lower carbon cost.	Developed by U. S. Bureau of Mines at Albany, Ore. \$25 million plant will be first large-scale U. S. nickel production.
Germanium .....	Zone melting .....	Bell Telephone Labs. .... Murray Hill, N. J.	Process purifies metals such as germanium, also organics and inorganics. Since impurities generally more soluble in liquid, progressive melting of ingot in circular induction heaters sweeps impurities to one end.	Developed by William Pfann of Bell, process now used commercially for near-perfect germanium, can be used also for waxes, salt, other metals.
Iron .....	Electrolytic .....	.....	Dense, malleable iron sheets, 99.99% pure, are produced from pyrrhotite via ferrous chloride electrolysis in cell with graphite anodes and stainless steel cathodes. Sulfur is a byproduct.	Developed at Univ. of Vermont. Patents owned by Sulfide Ore Process Co. Plans underway for a commercial plant.
Iron ore .....	Byproduct from low grade nickel ores	International Nickel Co. (Canada) Sudbury area, Canada	.....	Immediate construction planned for \$16,000,000 plant to provide 1,000,000 tons/yr. of iron ore.
Magnesium .....	Sludge recovery .....	Dow Chemical Co. .... Freeport, Tex.	Magnesium previously discarded in sludge will now be recovered.	Plant to recover 2,500,000 lb./yr. will be constructed.
Magnesium sheet .....	Continuous .....	Dow Chemical Co. .... Madison, Ill.	Continuous, direct chill casting of rolling and extrusion stock. Molten magnesium is pumped by a centrifugal pump into the top of vertical copper tube. Cooling water plays over the tube, and a solid column of magnesium moves out the bottom. Billets are then rolled.	The first installation for mass production of magnesium plate, sheet and extrusions is in operation.
Manganese .....	Acid treatment .....	.....	Ore is treated with nitric acid.	Developed by E. S. Nansen Laboratories; 2 ton/day unit under construction for DMPA.
Manganese .....	From low-grade concentrates	.....	Concentrate is reacted with SO <sub>2</sub> to get MnSO <sub>4</sub> , which is evaporated, crystallized and sintered to MnO <sub>2</sub> . Reaction takes place at 600 psi. in presence of oxygen.	Developed by Chemical Construction Corp.
Manganese .....	Recovery .....	.....	Blast furnace and converter treatment of open hearth slag.	Pilot-plant tests made at Pittsburgh under sponsorship of American Iron and Steel Institute and U. S. Bureau of Mines.
Manganese .....	Smelting .....	.....	Process recovers manganese from steel plant slag. Basic open hearth slag is smelted to produce a low-manganese alloy. Selective oxidizing in a Bessemer produces a cinder having 50 to 60% manganese. Final smelting forms 90% ferro-manganese.	A 400-ton demonstration plant is in operation at Pittston, Pa. Developed by P. H. Royster of Mangaslag.

**METALS (Continued)**

*PRODUCT	*PROCESS	*USER & LOCATION	*FEATURES	*STATUS & REMARKS
Metal deoating.....	Chemical washing..	General Iron & Metal Co..	Chemical washing process for deoating galvanised and enameled scrap prior to steelmaking.	
Plating of metals....	Electrolytic.....		Nickel plating process operates at low temperature. Bath contains nickel sulfate, nickel chloride, boric acid and brightener additives.	Developed by Hanson-Van Winkle-Munning. Pilot-plant operating.
Molybdenum.....	Electrolytic.....		A high purity molybdenum is made from a solution of potassium hexachloromolybdate in a molten mixture of alkali halides. Pure molybdenum is deposited on a cathode at a temperature of 900 C. and current densities of 3-100 amp./sq. dm.	Developed by National Bureau of Standards for Army Ordnance.
Nickel.....	Ammonia leaching..	Sherritt Gordon Mines Ltd. Edmonton, Alta.	Similar to process used for cobalt. Sherritt Gordon to produce copper, nickel and cobalt jointly.	Chemico's reduction process combined with user's ammonia leaching process. \$41 million plant was to be completed late 1953.
Nickel plating.....	Kanigen.....	General American Transportation Corp. Chicago, Ill.	Non-electrolytic process uses complex nickel chloride-sodium hypophosphate solution. Can plate on most metals, plastics, glass. Costs 50 c. to \$1/mm. thickness/sq. ft.	General American plans two plants, will license process to others.
Silicon.....	Iodide.....	Foote Mineral, Du Pont... Various	Modified iodide (hot wire) process, produces high-purity metal. Called Arkle-DeBoer process.	Pilot plants in operation.
Sodium.....	Solids coating.....	National Distillers Chemical Co. Ashtabula, Ohio	Molten sodium is coated onto solids such as salt, soda ash, carbon, alumina, giving extremely reactive product said to be advantageous for all chemical uses of sodium.	Production being marketed by U. S. Industrial Chemicals.
Steel.....		National Lead; Republic Steel Various	Will construct new pilot plant to test commercial feasibility of using southern iron ores for steel production.	
Tantalum and niobium	Liquid-liquid extraction	Bureau of Mines Albany, Ore.	Continuous countercurrent extraction of ores in 12 ft. diam. perforated pulse column, from HF-HCl-di-isopropyl lactone system.	Tantalum is produced at 99.79% purity. Pilot plant only.
Thorium.....	Caustic treatment..		Monasite is reacted with hot, concentrated NaOH; hydrous metal oxides are separated, then dissolved in HCl. Thorium product is precipitated by partial neutralization of the resulting acid solution.	Process developed for AEC by Battelle Memorial Inst. on pilot-plant scale.
Titanium.....	Double-melting....	Armour Research Foundation Chicago, Ill.	Double-melting process produces titanium alloy ingots weighing up to 100 lb. in arc furnace which has consumable electrodes.	Announced January 1954.
Titanium.....	Electrolytic.....		Commercially pure titanium powder is produced by electrolysis of $K_2TiF_6$ in molten sodium chloride. Salt-free titanium is found on outer part of cathode deposit.	Developed by Horizons, Inc. In pilot-plant stage.
Titanium.....	Electrolytic.....	Shawinigan Water & Power Canada	Production of high-grade titanium by a new electrolytic process is claimed. Details not available.	Announced May 1954.
Titanium.....	Electrolytic.....	United International Research, Inc. Long Island City, N. Y.	Electrolytic cells melt titanium oxide under a blanket of inert gas. Capacity is 4 lb. of sponge metal/hr./cell. Produces 99.2% Ti.	Pilot plant reported operating.
Uranium.....	Alkaline pressure leaching		Uranium ore, containing pitchblende, is mixed with sodium carbonate solution and autoclaved continuously at 100 psi. in presence of air. Uranium solution then autoclaved with hydrogen and nickel catalyst.	Process developed at Univ. of British Columbia.
Uranium.....	From phosphate rock	Blockson Chemical Co.... Joliet, Ill. International Minerals & Chemical Corp. Bonhe, Fla. Virginia-Carolina Chemical Corp. Nichols, Fla. Others	Superphosphate is leached, leach solution is solvent-extracted, and uranium salt, containing also rare earths, is precipitated. Consideration also being given to extracting both uranium and phosphate from phosphate over-burden or "leached zone."	Process now operating produces in the range of 60,000 to 160,000 lb. $U_3O_8$ per year at Bonhe plant alone. Equivalent in energy value to a large coal mine.
Zirconium.....	Arc dissociation....	Atomic Energy Comm....	Zirconium metal produced by arc dissociation of halides in a continuous process.	Developed by National Research Corp. for AEC.
Zirconium.....	Modified Kroll.....	Carborundum Metals Co.. Akron, N. Y.	Zircon sand is converted to zirconium carbide, thence to zirconium tetrachloride, which is purified of its hafnium content; and reduced with magnesium to Zr metal sponge.	\$2.5-million plant in operation; rated at 150,000 lb./yr.





... FOR DAIRIES



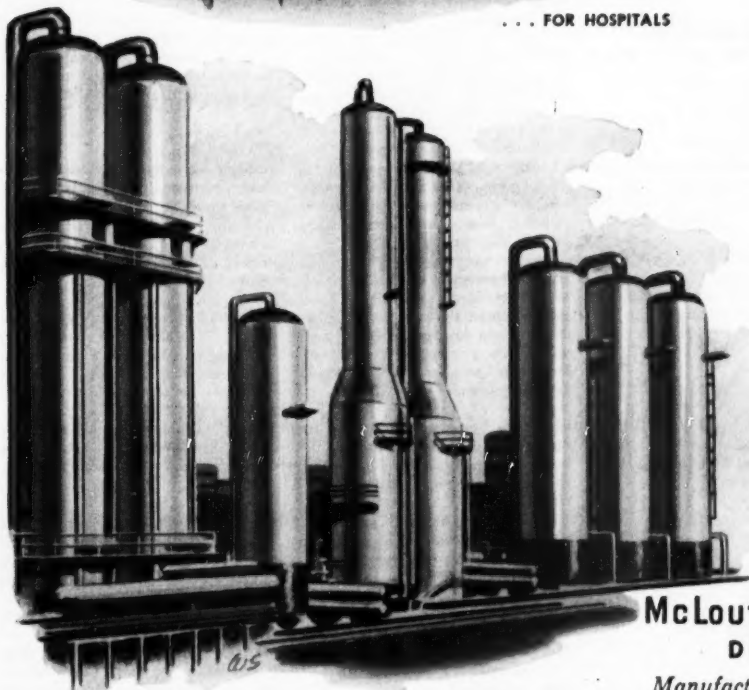
... FOR HOSPITALS

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and strip steel . . . for the product  
you make today and the  
product you plan for tomorrow.



... FOR THE  
CHEMICAL INDUSTRY

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DETROIT, MICHIGAN  
*Manufacturers of Stainless and Carbon Steels*

**PETROLEUM & NATURAL GAS PRODUCTS**

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Aromatics.....	Platrenting.....	Roosevelt Oil & Refining Corp. Mt. Pleasant, Mich.	Process uses byproduct hydrogen from a Platforming unit to saturate the olefins in an aromatic distillate, permitting recovery of aromatics in a Udex unit. Process makes use of a platinum-base catalyst.	Developed by Universal Oil Products Co. Unit is on stream.
Butadiene.....	Catalytic purification	Dow Chemical Co..... Freeport, Tex.	Selective catalytic hydrogenation of crude butadiene from ethylene manufacture eliminates C <sub>4</sub> acetylenes. Then the product is purified by distillation and extraction.	Process in use in \$3.5 million plant.
Carbon black.....	Controlled combustion	Lynn Carbon Black Co.... San Angelo, Tex.	Much higher yield than existing processes and much lower equipment cost. Claimed to enable new process to be used economically on small flare-gas supplies at refineries.	Lynn will license process.
Ethylene and propylene.....	Pebble-heater cracking	Phillips Petroleum Co..... Borger, Texas	For cracking and high temperature superheating of light hydrocarbons pebble-heater unit has now operated for several years at 30,000,000 Btu./hr. New development consists of two refractory-lined vessels, heater and reactor, one above the other. The pebbles used are 1/4-in. spheres.	Yield of ethylene from butane is 50% greater than in tube furnaces. Yield of ethylene-acetylene from ethane-rich feed is 25% greater and at the hitherto unattainable level of 91% conversion of ethane.
Ethylene oxide.....	Catalytic oxidation..	Allied Chemical & Dye.... Corp. Orange, Tex.	High-pressure air is mixed with ethylene and passed over catalyst. The ethylene oxide is hydrated to glycol in scrubbing towers. It is concentrated by fractionation.	Process developed by Scientific Design Co. Allied's \$5 million plant is now in operation. First U. S. application.
Ethylene oxide.....	Direct oxidation.....		Direct oxidation of ethylene with oxygen in fixed bed produces ethylene oxide. Hydration of the oxide produces ethylene glycol.	Developed by Shell Development Co., available through Lummus Co.
Fuel gas.....	Thermal cracking...		Cracking of propane, butane and natural gasoline in a 2.5-in. dia. tube furnace at 3 atm. pressure. Reaction times are on the order of 11 sec.	Developed by Inst. of Gas Technology. Process makes natural gas substitutes and can be used to supplement normal gas supplies during peak demand periods.
Fuel gas.....	Pyrolytic cracking..		Thermoform pyrolytic cracking (TPC) process produces 950-1,050-Btu. fuel gas from reduced crudes or other heavy petroleum fractions. Uses a bed of moving solid coke particles as a pebble heater to heat charge and retain at the same time all carbon resulting from cracking.	Process resembles Socony-Vacuum's TCC process. Developed by Surface Combustion Corp. in cooperation with Socony-Vacuum.
Fuel oil, kerosene....	Mercaptan removal.	Standard Oil Co. (Ind.)... Whiting, Ind.	Mercaptans can be removed from sour heavier distillates without serious color formation by treating with a controlled amount of air or oxygen in the presence of aqueous KOH (50-60% wt. concentration) at 80-125 F. in the presence of a particular copper catalyst.	Mercaptans converted to disulfides without forming objectionable color bodies—with phenomenal rates. Described in U. S. Pat. 2,646,389.
Gasoline.....	Catalytic hydroforming	Standard Oil Co. (Ind.)... Whiting, Ind.	First commercial size will change 30,000 bbl./day low octane naphtha into high octane hydroformate for gasoline blending. Reactor and regenerator are in vertical alignment.	Orthoflow catalytic hydroforming process, developed by Standard Oil, jointly with M. W. Kellogg Co., available from latter. Plant to be completed by end of 1954.
Gasoline.....	Catalytic cracking..	Sinclair Refining Co..... Houston, Tex.	Cat cracker recovers waste heat from catalyst regenerator gases. It is used for auxiliary steam production.	Designed by Sinclair, cracker is handling 50,000 bbl./day.
Gasoline.....	Catalytic reforming.	Sinclair Refining Co..... Marcus Hook, Pa.	New platinum catalyst said to give higher activity over longer periods of time and to have greater ability to convert low-octane paraffins to high-octane aromatic gasoline.	Developed jointly by Sinclair and Baker & Co. Engineering of new 16,000 bbl./day unit by C. F. Braun & Co. for completion mid-1954. Process available for license; Pure Oil plants unit.
Gasoline.....	Catalytic reforming.	Standard Oil Co. (Ind.) and others Wood River, Ill. and elsewhere	Ultraforming process, developed by Standard Oil (Ind.) is fixed-bed reforming process with platinum-containing catalyst supplied by American Cyanamid Co.	Capacity totalling 40,000 bbl./day to be installed by SO Ind, Pan-Am, Pan-Am Southern and Canadian Petrofina, Ltd.
Gasoline.....	Continuous contact coking		Continuous process handles much heavier feedstocks than can be processed by conventional delayed coking.	Investment and operating cost both less than for delayed coking unit. Gives lower coke production, higher gas and gasoline yields. Offered by Lummus Co.
Gasoline.....	Fluid coking.....	Carter Oil Co..... Billings, Mont.	Requires no catalyst. Uses circulating stream of finely divided coke to furnish heat for coking reaction. Converts crude oil residuum to lighter oils and coke.	Process requires no periodic shut-downs for coke removal. Developed by Standard Oil Development Co. Will be in use by late 1954. Units planned to be built also for Baltimore and Baton Rouge.



# how

## FILM MAKERS CUT CASTING, CHILLING, DRYING COSTS

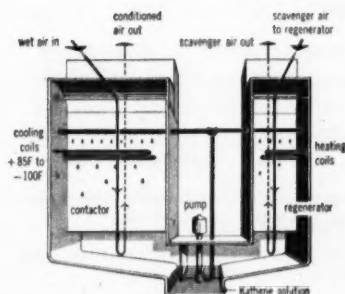
The leading manufacturers of photographic film and paper needed dry air at low temperatures for their casting, chilling, and drying processes. And they wanted it *without* frost, excessive reheating or aftercooling, high power requirements, carry-over, corrosion, and high maintenance and service costs.

They obtained air at the precise conditions they wanted by installing Kathabar humidity conditioning units, and avoided problems common to other dehumidification systems. For the casting process, where film dope changes from a viscous liquid to a transparent strip, Kathabar units deliver air at 104F and 47.5 grains/lb. with 53F water. For chilling the emulsion, they deliver air at 6.5F, 5 grains/lb., frost-free with OF refrigerant. For drying the emulsion, they provide 140F, 36-grain air, with 75F water.

The results have been better process control, improved product quality, and lower costs. One manufacturer, for example, saved \$40,000 annually in excess refrigeration by using Kathabar units for drying photographic paper.

Similar results have been achieved with Kathabar units in other industries: foods, pharmaceuticals, petrochemicals, brewing, glue, candy, atomic energy, lithography. For details, write for Literature Group K54-1C, including our just-published brochure, "HUMIDITY CONDITIONING."

### WHAT COULD BE SIMPLER?



Air to be conditioned passes through the contactor, where an absorbent solution removes moisture (the amount depends on the automatically-controlled temperature of the solution). In the automatic regeneration, about 15% of the solution is heated, and the moisture it releases is blown out the window.



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CHEMICAL ENGINEERING—Inventory Issue 1954

Inquiry Code Number for this advertisement —83

83

## PETROLEUM & NATURAL GAS PRODUCTS (Continued)

*PRODUCT	*PROCESS	*USER & LOCATION	*FEATURES	*STATUS & REMARKS
Gasoline treating....	Extraction.....	Magnolia Petroleum Co. Beaumont, Tex.	Mercaptan separation from gasoline improved by using three-component solvent of composition giving two phases where mercaptan equilibrium is more favorable. Uses combined mixer settler.	Called Dualayer process. Gives better mercaptan removal than other methods. Unit under construction at Beaumont.
Lubricating oils....	Continuous percolation	.....	Continuous countercurrent percolation technique for decolorizing lubricating oils and waxes. Clay used for decolorizing is continuously fed into oil. Spent clay is drawn off, washed with naphtha and recycled.	Developed by Socony-Vacuum Oil Co. One unit in England, another in Holland under construction.
Lubricating oils....	Hydrofinishing.....	Imperial Oil Co..... Edmonton, Alta., Canada	Hydrofinishing process for finishing lube oils involves passing hydrogen through the lubricant to remove impurities. It replaces clay filtration. Hydrogen comes from catalytic reformer.	First unit being built.
Oil.....	From rock asphalt..	W. M. Narnes Co..... Los Angeles, Calif.	Utah rock asphalt extracted to yield a product similar to virgin gas oil, low in sulfur and nitrogen and susceptible to conventional cracking techniques.	Pilot plant results are said to show process ready for commercial operation.
Petroleum distillates..	Desulfurization.....	.....	Catalytic vapor-phase desulfurization process for use on distillates from naphthas to heavy diesel fuels removes sulfur as $H_2S$ or other compounds.	Bench-scale work completed by Wigton-Abbott Corp., large pilot plant contemplated.
Petroleum distillates..	Desulfurization.....	Union Oil Co..... Los Angeles, Calif.	Catalytic refining process (Unifining) upgrades low quality petroleum fractions by removing sulfur and nitrogen. This is done by mixing feed stock with recycle hydrogen, vaporizing, and passing the mixture through a bed of cobalt-molybdate catalyst.	First unit under construction at Union's Oleum refinery. Designed for 15,750 bbl/day.
Petroleum distillates..	Hydrodesulfurization	Shell Oil Co..... Stanlow, England	Liquid-phase process can handle heavy charge stocks, eliminates need for vaporization, achieves longer onstream periods.	Construction of first unit started in 1953. Available through Lummus Co.
Petroleum waste..... disposal	Bacterial oxidation..	Sun Oil Co. Ltd..... Sarnia, Ont., Canada	Refinery waste water containing phenol or other dissolved organics is oxidized by bacteria in presence of air in 90x70x12 ft. oxidation pit.	Sun has disclosed all technical information to International Joint Commission on Water Pollution. Other oil companies are experimenting.
Residuum upgrading..	Decarbonizing.....	.....	Decarbonizing process upgrades residues of oil refining that are fluid enough to be pumped.	Process available from Blaw-Knox Co.
Shale oil.....	Pipeline retort.....	U. S. Bureau of Mines.... Laramie, Wyo.	Shale crushed to $-1/4$ in. is carried by superheated steam through a reactor tube at 900-1,800 F. with not over 3 sec. exposure.	1-ton-day pilot plant shows superior results compared with other retorting methods; also produces large quantities of aromatic chemicals.
Shale oil.....	Fluidized retorting..	.....	Finely ground oil shale can be completely retorted in fluidized bed with both raw and retorted shale remaining free-flowing.	Experimental work at Univ. of Colorado, Boulder, Colo.
Shale oil.....	Underground combustion	Sinclair Research Laboratories..... Harvey, Ill.	Initial field experiments to produce crude shale oil from Colorado shale bed by controlled underground combustion said to have been successful.	.....

## PLASTICS AND RESINS

Acrylic monomers...	From acetylene....	Rohm & Haas Co..... Deer Park, Tex.	Acetylene reacts with CO and alcohol; reaction is initiated with nickel carbonyl.	\$8-million plant in operation; replaces ethylene-based process.
Chlorinated..... polyesters	From pentane and maleic anhydride	Hooker Electrochemical Co. Niagara Falls, N. Y.	Pentane is chlorinated and cyclized, reacted with maleic anhydride, esterified with glycols.	In production. Resin is fire-resistant, stable to heat.
Fluorothene resins..	Continuous.....	Carbide & Carbon Chemicals Corp. South Charleston, W. Va.	.....	Commercial production began in early 1954.
Glass-resin..... bonding	Chemical bonding..	Naval Ordnance Laboratory White Oak, Md.	Properly substituted chlorosilanes are thought capable of bonding chemically not only to glass but to reactive groups in all three commonly used resin types, phenolics, epoxys and polyesters.	Pilot plant production is scheduled.
Polyethylene.....	Low-pressure synthesis	Phillips Chemical Co..... Houston, Tex.	Process operates at 500 psi. instead of 15,000-30,000 psi. as in present processes.	Pilot plant to be built.
Polyethylene.....	Synthetic.....	Allied Chemical & Dye Corp. Tonawanda, N. Y.	Ethylene is derived from gas produced from fuel oil. Plant produces low molecular weight polyethylene.	Ethylene plant designed by Lummus, polyethylene plant by Semet-Solvay engineers.
Polyethylene, pelletized	.....	Koppers Co..... Port Arthur, Tex.	.....	Production scheduled for mid-1955.



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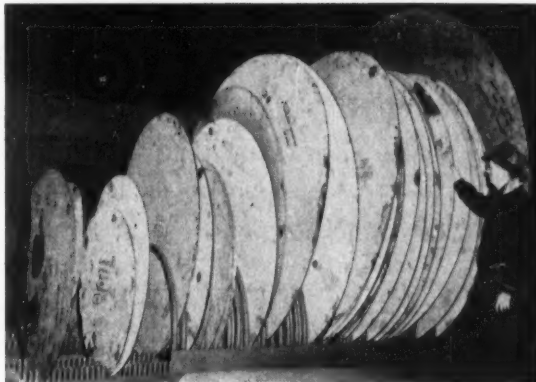
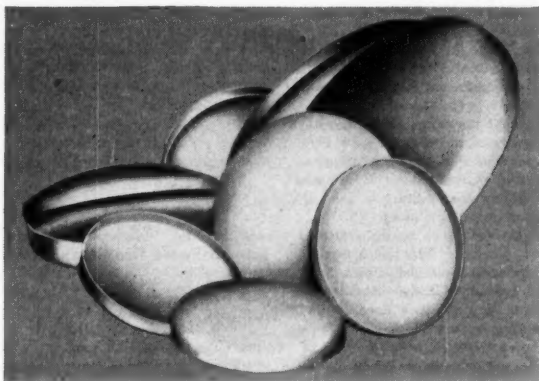
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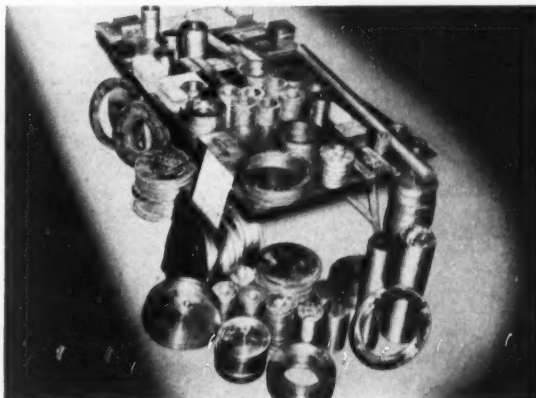
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District Sales Offices in Principal Cities

**PLASTICS & RESINS (Continued)**

* PRODUCT	* PROCESS	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Polymers.....	High-energy irradiation	General Electric Co., Pittsfield, Mass.	Few seconds exposure to particle bombardment produces cross-linking of long-chain polymers such as polyethylene, nylon, polystyrene, polyvinyl chloride, polyvinyl alcohol and Carbowax.	Tests conducted in atomic pile in England and with a million-volt X-ray machine at G. E. in the U. S. Polyethylene is converted to insoluble, infusible plastic. Now in pilot plant stage.
Polysulfone resin....	Emulsion polymerization	Phillips Chemical Co., Houston, Tex.	Olefine and SO <sub>2</sub> mixed with water, emulsifier and catalyst, stirred 4-6 hr. at 100 F. and 75 psig. Product is white thermoplastic resin.	Phillips expects to build but this is a long-range project.
Polyvinyl alcohol....	Continuous.....	E. I. du Pont de Nemours & Co., Niagara Falls, N. Y.	PVA is made by new continuous alkaline hydrolysis process. Details unavailable.	
Polyvinyl chloride...	Internal plasticizing		Vinyl stearate is copolymerized with vinyl chloride; stearate can't migrate or evaporate. Stearate content can be adjusted to produce either rigid or flexible plastic.	Developed by U. S. Dept. of Agriculture. National Starch, Dewey & Almy also working on internal plasticizing.
Protein plastics.....	From fish.....	Wm. A. Mohn & Son A. S., Bergen, Norway	Skins and fresh fish waste are raw material. 5 tons of waste will make a ton of molding powder. Partial and controlled hydrolytic decomposition of the fish protein gives a satisfactory flow characteristic for a molding powder. Adding formaldehyde then produces a thermosetting material.	Economically feasible in Norway.
Resins, synthetic....	Outdoor kettle.....	Reichhold Chemicals, Inc., Elizabeth, N.J.	First outdoor installation for resin production in northern climates. Special insulation protects against cold weather.	Trial installation may lead to wider adoption of outdoor plants in the North.
Resin, water-dispersed		Reichhold Chemicals, Inc., Detroit, Mich.	New resin contains three components, a phenol-formaldehyde resin, an alkyd resin, and ammonia to make mixture water soluble. Finishes must be baked.	Expect new resin to be useful in metal finishes, saving users 10-25% compared with present coating costs. Called Hydrophen.
Styrene monomer....	Ethylbenzene.....	Foster Grant Co., Baton Rouge, La.	Ethylene and benzene are alkylated with AlCl <sub>3</sub> catalyst, dehydrogenated to styrene in presence of iron oxide, vacuum distilled for purification. Hydroquinone (rather than sulfur) is used as inhibitor during distillation.	Plant operating, designed for later expansion. Yield expected to be similar to Dow process, about 86.5% over-all.
Urea-formaldehyde resins	Polymerization.....		Sugar and urea react to form a preliminary product. This then is reacted with aqueous formaldehyde to form sugar carbamate resin. Air drying converts the resin to a hard, water-resistant, transparent film.	Developed by Sharples Chemicals. Laboratory-scale experiments only, so far.
Vinyl chloride.....	From natural gas...		New laboratory development of Univ. of Texas adds chlorine to low-acetylene gases produced by arc and thermal processes, forms HCl in place and reacts to form vinyl chloride.	Process uses HgCl <sub>2</sub> -BaCl <sub>2</sub> catalyst, with initiation by growing wire. To be offered by Fluor Corp. when ready for commercial use.

**PULP AND PAPER**

Battery separators...	Wood fiberization..	Evans Products Co., Coos Bay, Ore.	Wood is fiberized and reformed into finished separators.	In production.
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## Your Inventory of New Processes and Technology

### What It Contains . . .

This inventory lists some 294 new processes and technology advances announced or commercialized during 1953 and the first half of 1954. For previous developments, consult CE's tabulations published February 1951, 1952, 1953, January 1954.

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PULP & PAPER (Continued)

• PRODUCT	• PROCESS	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Black liquor recovery	Combustion.....		Rearrangement of heating surfaces in superheater cuts slag formation, spray gun delivers superheated feed which gives partial flash drying.	Offered by Combustion Engineering, Inc.
Cellulose.....	From banana stalks	Cia de Cellulose Banex..... Brazil		Process developed in Britain, known as Polpex.
Crepe paper.....		General Electric Co..... Pittsfield, Mass.	Made of kraft and manila fibers, has triple the strength of previous industrial crepe paper.	Used for cable wrapping.
Kraft pulp.....	Odor control.....	Nekoosa-Edwards Paper Co..... Nekoosa, Wis.	Chemical agent added to digester masks odors throughout pulping and recovery systems.	Developed by Du Pont, used on trial at Nekoosa.
Newsprint.....	Semichemical pulping	Kinsey Chemical Co.....	Allows use of 40% poplar wood in newsprint compared to 20% previously used successfully.	Process announced late 1953.
Newsprint.....	Alkaline extraction of bagasse	Valentine Pulp & Paper Co. Lockport, La.	First commercial mill for newsprint from bagasse will use rapid processing cycle including prehydrolysis followed by alkaline extraction and light but conventional refining.	Spending \$2.6 million for 50 ton/day mill. Rayon Corp. of the Philippines plans to make dissolving pulp from bagasse.
Newsprint.....	Chemigroundwood..	Great Northern Paper Co.. E. Millinocket, Me.	First use of hardwood for newsprint in North America. Process involves pretreatment of hardwood in pressure vessels, followed by grinding. Product is mixed with softwood pulp.	Experimental work completed. Great Northern is expanding output and including facilities for new process.
Newsprint.....	Papermaking.....	Beloit Iron Works..... Beloit, Wis.	Suction pick-up and transfer system moves fragile web from fourdrinier wire to press section, permits higher running speeds.	
Paper.....	Press roll load control	Gibralter Corrugated Paper Co..... North Bergen, N. J.	Strain gage load meter measures roll loading within 0.25%.	Installed and operating.
Paper.....	Weight control....	Strathmore Paper Co..... West Springfield, Mass..	Absorption beta gage assures uniformity, holds sheet weight to less than 3% variation.	Installed and operating.
Pulp, bleached.....	Chlorine dioxide....	Riegel Carolina Corp..... Acme, N. C.	Plant manufactures own chlorine dioxide from sulfuric acid, sodium chlorate, methanol vapor and air. Water solution at 160 F. is used as last bleaching stage for pulp after hypochlorite bleaching.	Plant built and process developed by Solvay Process Div., Allied Chemical & Dye Corp.
Pulpwood.....	Chemical debarking.	Various.....	Live trees are debarked by use of sodium arsenite.	17 firms have purchased process for public use.
Sulfite pulp.....	Continuous.....	American Box Board Co.. Filer City, Mich.	A completely continuous process for making pulp from hardwoods. Includes new, continuous digester, together with refining and screw press washing.	Designed by American Box Board and Sumner S. Sollitt Co. A 13 ton/hr. plant is in operation.
Sulfite pulp.....	Magnesia base.....	Weyerhaeuser Timber Co.. Longview, Wash.	Process substitutes MgO for lime. Big advantage is non-pollution of streams since all waste liquors are burned for power generation.	Now operating commercially on 300 ton/day scale. Process is being used also by Ketchikan Pulp Co. in new Alaskan mill.
Sulfite pulp.....	Soda-base pulping..	Nekoosa-Edwards Paper Co..... Port Edwards, Wis.	Process substitutes caustic soda for limestone in making sulfite cooking liquor. This is expected to make cooking liquor recoverable and so cure pollution problem.	Developed by Western Precipitation Corp. About 500 tons of pulp has been made by this process but critical evaluation of recovery process will be needed before company can decide to go ahead.
Wood panelboard....	Continuous.....	Bartrev, Ltd..... Colchester, England	Resin-treated wood particles are fed in continuous carpet on stainless steel belt, bonded by heat and pressure, finally emerge as continuous length of board.	Available in U. S. through Aries Fiberboard Corp., New York.
Wood pulp.....	Va-Purge.....	Various.....	Preliminary steaming and purging step gives faster, more complete liquor penetration of wood chips, shortens cooking time, increases yield and uniformity.	Undergoing trials in a number of mills.

RUBBER

Cold rubber.....	Pipeline reactor....	B. F. Goodrich Chemical Co. Akron, Ohio	Fast-acting catalyst and rapid heat transfer in pipeline reactor cut polymerization time to 15 min. instead of usual 10-12 hr.	750 lb./day pilot plant in operation, using 250 ft. of 1½-in. pipe as continuous reactor.
Cold rubber.....		U. S. Rubber Co..... Naugatuck, Conn.	Company reports successful experimental production of synthetic latex by new process which makes cold rubber in shorter times and at lower costs than in Government plants.	

**RUBBER (Continued)**

• PRODUCT	• PROCESS	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Polyester rubber.....	Controlled polymerization	Goodyear Tire & Rubber Co..... Akron, Ohio	Ethylene and propylene glycols polymerized with adipic acid; reaction controlled with di-isocyanates. Product can be processed on conventional rubber machinery.	Still undergoing research; promising prospects for tough tire treads.
Reclaimed rubber.....	Powder.....	Mid-West Rubber Reclaiming Co..... E. St. Louis, Ill.	Rubber produced in powdered form offers several advantages for ease of compounding and automatic handling.	Recently developed as replacement for conventional slab reclaimed rubber.
Synthetic rubber, GR-S	Carbon black dispersion	Copolymer Corp..... Baton Rouge, La.	Steam jet used to disperse carbon black in latex. Eliminates wetting agents, gives tougher rubber.	Pilot-plant operation.

**TEXTILE FIBERS**

Acrylic fiber.....	Polymerization & spinning	Chemstrand Corp..... Decatur, Ala.	Process improvements have eliminated fibrillation, reduced brittleness of Acrilan acrylic fiber.	In production.
Dynel.....	Dope dyeing.....	Carbide & Carbon Chemicals Corp.	Fiber has color in it as spun. Acetate, viscose and Saran have also been dyed this way.	In operation.
Cotton.....	Chemical treatment.....		Structurally different fiber is made by treatment of ordinary cotton fiber, yarn or fabric with acrylonitrile.	Developed by Institute of Textile Technology.
Nylon cord.....	Hot stretching.....	General Tire & Rubber Co.	Nylon tire cord is stretched nearly to the breaking point under heat, then dipped in crude rubber. Tires with these cords stretch less in use.	Product called Nygen. In commercial production.
PVA fiber.....	Solution spinning...	Kurashiki Rayon Co..... Osaka, Japan	Polyvinyl alcohol is spun into fiber from solution. Filament can be treated chemically or physically to make it water-resistant.	In operation, 20 tons/day. Product known as Vinyon.
Rayon staple.....	Spin dyeing.....	Courtaulds (Alabama) Inc..... Mobile, Ala.	First U. S. production of spun-dyed viscose staple, being made in 10 colors. Made by incorporating dye in viscose before spinning.	Developed by Courtaulds Ltd., in England.
Synthetic fibers.....	Polymerization.....		Polyaminotriazole (PAT) filaments are made by reacting sebacic acid, 60% hydrazine and acetamide in an autoclave at 210 C. for 15 hr. The product, when formed into filaments, has high strength and good dyeability.	Process, developed by British Celanese, is in the laboratory stage.
Synthetic fibers.....	Yarn mixing.....	Textile Research Institute.	New yarn mixing process said to help solve problems of dyeing and static electricity in synthetic fiber constructions.	Announced late 1953.

**MISCELLANEOUS TECHNOLOGY**

• OPERATION	• EQUIPMENT	• USER & LOCATION	• FEATURES	• STATUS & REMARKS
Atomic energy..... production	Water-cooled reactor	Univ. of California..... Los Alamos, N. M.	Smallest and most economical chain reactor thus far constructed. Water used as both the cooling agent and the moderator.	In operation since 1953.
Atomic power..... production	Homogeneous reactor	Union Carbide & Carbon Corp. Oak Ridge, Tenn.	First successful production of electric power at a temperature and pressure high enough to run a standard turbo-generator.	Reactor has been brought up to full design power of 1,000 kw. output.
Atomic power..... production	Pressurized water reactor	Duquesne Light Co. and AEC Shippingport, Pa.	First large-scale test of atomic power generation will produce 60,000 kw. of electric power in reactor cooled and moderated with heavy water at 2,000 psi.	To be built by Westinghouse, reactor is similar in principle to reactors for the two nuclear-powered submarines.
Atomic power..... production	Sodium-graphite power reactor	North American Aviation Santa Susana Mts., N. M.	\$10 million atomic power reactor will use graphite moderator and sodium for heat transfer.	Not started mid-1954; completion expected in 1958.
Coal gasification.....	Cyclone chamber...	Ruhrgas A. G..... Essen, Germany	Process gives 490-Btu. producer gas from pulverized bituminous coal and lignite by gasifying in a vortex or cyclone chamber with air blast preheated to 1,100 F., and liquid slag removal.	Process now in use, said to give better results on low-grade fuels than conventional gas producers.
Coal gasification.....	Pulse-jet producer..	Ruhrgas A. G..... Essen, Germany	Experimental coal gasification process uses preheated air and finely ground low-grade coal, mixed in pulse-jet type gasification chamber.	Results indicate gasification efficiencies around 63% and heating values around 107 Btu./cu. ft., using air to gasify.
Diffusional operations	Rosette packing.....		Packing is shaped as a helix in form of doughnut. Design based on high interstitial holdup rather than wetted surface. Performance is good, even made from nonwetting plastics like polyethylene.	Development reported by A. J. Teller, Fenn College, Cleveland. To be marketed by Maurice A. Knight, Akron, Ohio, under name "Tellerette."



# The only magnetic separator that tells you when your magnet needs cleaning:

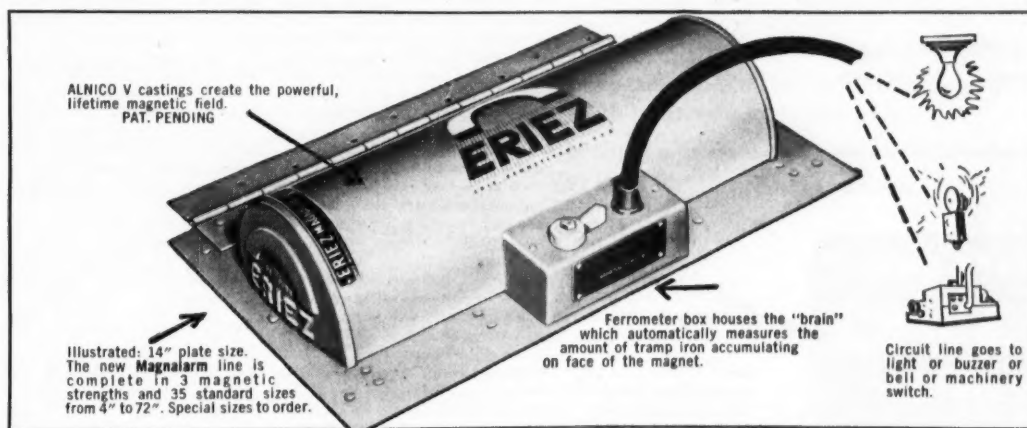
it's the new **MAGNALARM**

*Magnalarm*, the revolutionary Eriez invention with a ferrometer "brain", signals you *automatically* when the magnetic separator has collected a preset amount of tramp iron! Maximum efficiency is the result!

Tramp iron that used to "get by" due to overloaded and uncleaned separators is ended with a *Magnalarm*. Such

"extra" tramp iron could cause "extra" machinery damage, fires, product contamination.

Now *Magnalarm* signals you when the magnet plate needs cleaning. A light goes on . . . or a bell sounds . . . or the machinery line is shut down automatically. You are *always* guarded against costly tramp iron dangers with *Magnalarm*.



## HOW DOES IT WORK?

*Magnalarm's* "brain" is a ferrometer which measures the actual magnetic loading. When the amount of tramp iron across the entire face of the magnet reaches the predetermined Danger Point (which is where magnetic effectiveness is temporarily reduced to minimum operating efficiency), the "brain" acts! A circuit is opened or closed depending on the action you require. Open circuits are used to ring a bell or buzzer or turn on a light. Closed circuits are used to shut down your line of machinery. The signaling action continues until the *Magnalarm* has been cleaned of its dangerous tramp iron load. The only electric current required is that used to open or close the circuit. *Magnalarm* is in itself the same powerful, non-electric, permanent magnetic separator which won Eriez the position of being the world's largest manufacturer of permanent magnets!

## MAGNALARM "SAVINGS"

1. Trouble-saver by giving you the maximum protection against fires, machinery damage and product contamination.
2. Time-saver in eliminating the need of checking separators in remote and hard-to-get-to places.
3. Money-saver in eliminating the need of shutting down machinery while separators are checked.
4. Reputation-saver by guarding quality . . . telling you when and how much contamination you are getting in your line.

## CARBORUNDUM COMPANY FINDS MAGNALARM THE ANSWER TO DIFFICULT PROBLEM

Carborundum Company of Niagara Falls, N. Y., had a serious problem with tramp iron which was causing heavy machinery damage to a rice coal pulverizer. Because an installation of magnetic separators would necessarily have to be in a place difficult and awkward to inspect, the maintenance of an ordinary magnetic separator created its own special problem. Accumulations of tramp iron on the magnet could readily become excessive even with periodic inspections and the cost of damage caused by tramp iron which

"might get by" would result in labor and replacement parts expense. However, Carborundum Company found the new Eriez *Magnalarm* the perfect answer to its trouble. Inspection and cleaning of the magnetic separator is only necessary now when *Magnalarm* signals that a predetermined amount of tramp iron has been caught. So important to the company's equipment is the *Magnalarm* that Carborundum employs the signaling device which automatically shuts down the line the instant the alarm is tripped.

## COST, INSTALLATION AND MAINTENANCE

The cost of *Magnalarm* is only pennies more than regular magnetic separators. Installation is simple. Easy-to-follow instructions come with each unit. *Magnalarms* are preset at the Eriez factory but you can increase or decrease your *Magnalarm's* sensitivity by a simple adjustment.

## MAGNETIC EFFICIENCY AS GOVERNED BY TRAMP IRON ACCUMULATION

"*Magnalarm's*" signaling action makes sure you operate only in the strong, safe range marked "A." Strength of ordinary magnets will be lowered by tramp iron accumulation to the inefficient operating danger area marked "B" unless checked and cleaned frequently.



## WRITE FOR EXCITING, FULL DETAILS on *Magnalarm*, the only magnetic separator of its kind!

Fill out the easy coupon below. Do it yourself . . . or do it for someone within your organization who will be grateful for the complete "*Magnalarm*" story. Sizes. Magnetic strengths. Types of installation. Construction. Electrical circuits. Types of ferrometer element. Special features. Even how to order. It's all there.

# ERIEZ

Eriez Manufacturing Company  
74J, Magnet Drive, Erie, Pa.



Send me the "*MAGNALARM*" literature

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Company \_\_\_\_\_ Title \_\_\_\_\_

MISCELLANEOUS TECHNOLOGY (Continued)

* OPERATION	* EQUIPMENT	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Distillation	Kittel tray		Metal plate is perforated by expanded metal fabricating techniques. Capacity 30-50% greater than bubble trays.	German development. Can be made in a variety of metals.
Distillation	Turbogrid tray	Shell Oil Co., Shell Chemical, others Various	Tray consisting of parallel grid bars gives 20-100% higher column capacity, longer life, lower first cost, compared with bubble trays.	Developed by Shell Development Co. Available under license.
Energy production	Engine-turbine		Free-piston gas engine discharges hot gases to gas turbine. Thermodynamic efficiency is greater than rotary compressor-turbine units, equal to diesels.	Developed by Cooper-Bessemer Corp.
Filtration	Carbon filter aid		Carbon filter aid has high porosity and permeability, resists alkalis	Developed by Great Lakes Carbon, Morton Grove, Ill.
Filtration	Traveling pan filter	Davison Chemical Corp., Bartow, Fla.	Filter consists of endless series of pans traveling in apron-conveyor fashion. Provides good counter-current washing of cake and thorough washing of cloth.	Developed by Dorr-Oliver in Italy especially for phosphoric acid service.
Heat exchange	Rotary kilns	Various	Several new devices recently introduced get more efficient use of fuel in calcining operations by better dispersion of solids in hot gases.	Among them is Fuller-Humboldt pre-heater, developed in Europe and now being pilot-planted in Pennsylvania cement mill. Available from Fuller Co.
Hydrogen analysis	Beta-ray gage		Beta radiation measures hydrogen content of hydrocarbon sample.	Developed by Standard Oil Co. (Ind.), made by Central Scientific Co.
Ion exchange	Continuous		Portion of base-exchange zeolite is continuously withdrawn and regenerated in a separate column. Process operates with zeolite suspended in fluidized condition.	Developed by Dorr Co. for water softening.
Ion exchange	Regeneration		Sulfuric acid regeneration of high-capacity polystyrene cation exchangers is done stepwise with increasing concentrations of acid to avoid precipitation of calcium sulfate.	Developed by National Aluminate Corp., Chicago.
Liquid-liquid extraction	"Folded-channel" contactor	General Electric Co., AEC Knolls Atomic Power Lab, near Schenectady, N. Y.	Developed by G.E. for AEC work, extractor consists of shallow box divided into parallel channels with pump-like mixing impellers in each channel, settling sections between.	Unit is compact and easily shielded. Interface level is self-controlling. Unit is flexible.
Liquid-liquid extraction	Pulse columns		Mechanical pulsation of liquids in extraction columns (either sieve-plate or packed) can reduce HETS to one-third or less. Pulsation frequencies generally in range of 10-100/min., amplitudes 0.1-1.0 in.	Most of research done by or for Atomic Energy Comm. Extent of use in AEC plants unknown.
Liquid transfer	Sealless pump		Several new types, among them a centrifugal pump and motor integrated as a submerged unit, with stainless diaphragm between stator and rotor. Recommended for pumping dry liquid chlorine.	Commercially available from Peerless Pump Div., Los Angeles.
Mechanical separations	Gas cyclone		Machine has conventional tangential inlet, but entrance velocity is accelerated by rotation of a perforated rotor. Design said to give high efficiency on small particles.	Mfd. by Superior Separator Co., Hopkins, Minn.
Mechanical separations	Liquid cyclone		New design 2-stage liquid cylindrical cyclone makes full use of vortex in macro size range.	Developed by Equipment Engineers, San Francisco, Calif. Offered as EE cyclone.
Mechanical separations	Liquid cyclone		New design liquid cyclone contains built-in impeller to give greater centrifugal force for separating suspended solids by size. Can size particles in 10-40 micron range.	Developed by Equipment Engineers, San Francisco. Offered as Centriclone by Oliver United Filters.
Power rectification	Germanium rectifier		Germanium rectifiers for 50-125 v. range operate without contacts, have longer life than mechanical rectifiers.	Made by General Electric. One in use on electrolytic hydrogen, another on tin electrolysis.
Power recovery	Turbo-expander	Mississippi Chemical Co., others Yasoo City, Miss	Pressure of waste gas from nitric acid plant will be recovered by compressor-expander. About 75% of the power needed for compression will be recovered.	Cost of turbo-expander will be paid out in four years.
Process steam raising	Hydrocarbon gas turbine	Eso Standard Oil Co., A major refinery	Turbine will develop 5,700 hp. and drive a 16-stage centrifugal compressor to compress hydrocarbon gas from 1 atm. to 285 psig. Using natural gas as fuel, turbine will exhaust to waste heat boiler and make byproduct process steam.	Will be used for first time in 1954.
Solar energy conversion	Solar furnace	Consolidated Vultee Aircraft Corp., San Diego, Calif.	120-in. parabolic aluminum reflector focuses solar radiation on samples of metals and ceramics. Reaches temperatures as high as 8,500 F.	Used in materials research.

# Gyratory Screen

## Produces Soda Ash for Glass Making

...s. glass makers  
money in the manufacture of soda  
ash, according to Mathieson Chemical  
Corp.

Using this machine, Mathieson is producing a new coarse light soda ash product suitable for glass making. The new product, Mathieson believes, could eventually supersede "dense" soda ash heretofore generally used by glass plants.

To produce coarse light soda ash, Mathieson is completing a plant at its Saltville, Va., location that will produce 50,000 tons per year. It starts operating this fall. The new soda ash from this plant will be offered in bulk carload lots at \$28 per ton f.o.b. Saltville.

To further the development and make the product available to all glass makers, Mathieson has revealed that the new ash is made with a machine that has been used by the milling industry for years to sift flour. The device is a dynamically balanced gyratory sifter, and Allis-Chalmers furnished the sifters for the new soda ash plant at Saltville.

The coarse light ash has been used in the commercial production of glass, and large-scale tests in glass plants show it to have all of the necessary physical properties to make good glass.

After gaining operating experience in the new Saltville plant, Mathieson expects to install additional facilities for producing the new coarse ash.

- Eliminates need for soda ash densifying plant
- End product has all the physical properties needed to produce quality glass
- Enables manufacturer to offer finished product at lower cost

**GYRATORY  
CIRCLE  
SIFTER**

*This is just another example of how Allis-Chalmers equipment is helping solve today's chemical processing problems.*



*Reproduction of article in Chemical Engineering*

You can use an all-metal gyratory Circle sifter to separate dry granular products into two, three or four predetermined sizes. Silk or metal cloth screens of 2 to 350 mesh may be used.

**FOR MORE INFORMATION** about Circle sifters or other Allis-Chalmers equipment for your industry, call your nearest A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4329

Circle is an Allis-Chalmers trademark.

# ALLIS-CHALMERS



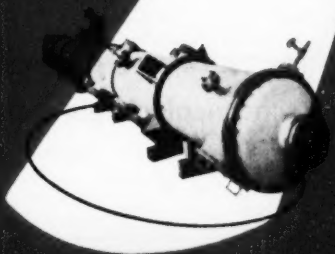
## MISCELLANEOUS TECHNOLOGY (Continued)

* OPERATION	* EQUIPMENT	* USER & LOCATION	* FEATURES	* STATUS & REMARKS
Solar energy conversion	Solar battery		A new solar battery is able to transform 6% of total incident light energy directly into electrical energy. The battery consists of wafer-thin silicon strips, each with a thin (less than 0.0001 in.) layer of boron. Conversion rate is 6 watts/sq. yd. of battery surface.	Developed by Bell Telephone Laboratories. In experimental state only spring 1954.
Solidification	Tube molding	Various	Tube-Ice machine now being applied to solidification of chemicals such as p-dichlorobenzene, and maleic anhydride.	Machines made by Henry Vogt Mach. Co., Louisville, Ky.
Solids handling	Gas lift	Union Oil Co. Wilmington, Calif.	New Hyperflow process for moving solids, e.g. catalysts, through pipes uses dense phase gas lift in non-fluidized form. Claimed to minimize attrition.	Developed by Union Oil for lifting, pelleted catalysts as high as 300 ft. at extremes of temperature and pressure. Now in use on Hyperforming and contact coking installations.
Vapor drying	Pressure-vacuum	Taylor-Colquitt Co. Spartanburg, S. C.	After pressure impregnation of wood with pentachlorophenol, solvent is removed by vapor drying. Savings result from recovery of solvent; migration of preservative to surface is avoided.	Treating costs have been reduced as much as 56%.
Waste disposal	Microbiological cultures	Various	Specially bred cultures of bacteria and fungi (supplied by Reliance Chemicals Corp., Houston, Tex.) produce enzymes that attack specific chemicals. Break down phenols, aldehydes, and cyclic compounds. Good for textile mill and paper wastes, etc. Fewer byproducts and less sludge.	Various process industries now exploring application of these cultures for waste treatment.
Waste disposal	Dephenolization	Koppers Co. Follansbee, W. Va.	Fortified oil extracts phenol from tar process waste water; caustic soda then extracts phenol from oil. Phenol content is reduced to 0.005%.	\$500,000 plant, now on stream, can handle 200,000 gal./day of process water, double the necessary capacity.
Waste disposal	Pickle liquor oxidation	Various	Partial air oxidation of gelatinous slurry (previously neutralized with lime) promotes rapid filtration.	Developed by A. O. Smith Co. and Elmco Corp.
Waste disposal	Chemical cyanide removal	Oneida, Ltd. Oneida, N. Y.	New process chemically converts cyanide wastes to CO <sub>2</sub> and nitrogen by hypochlorite oxidation. Settling, skimming and filtration steps complete the purification.	A 20,000 gph. plant in operation. Designed by Oneida, Yale Univ. and Westcott & Mapes.
Waste disposal	Sodium cyanide decomposition	Trubek Laboratories Rutherford, N. J.	Waste sodium cyanide is heated at 160 C. for 6-7 hr., decomposing to NH <sub>3</sub> and sodium formate. Cyanide is reduced to 3-4 ppm.	In operation.
Waste disposal	Thermophilic digestion	Coors Brewing Co. Golden, Colo.	Plant effluent is treated by oxidation, digestion at 130 F., pressure flotation. Result is smaller equipment, shorter treatment time and lower cost.	Operation started summer, 1953. First such process used in U. S.
Waste disposal	Wet combustion	Hammermill Paper Co. Erie, Pa.	Waste pulp liquor is oxidized with air at 480 F. and 800 psi. Organic chemicals combust to CO <sub>2</sub> and water. Energy can be recovered by means of a steam turbine.	Commercial-scale trial unit in operation. Developed by Salvo Chemical Co. Called Zimmermann Process. Unit built by Dravo Corp.
Waste heat recovery	Tangential furnace	Sinclair Refining Co. Houston, Tex.	Flue gas from cat cracker regenerator is fired with auxiliary gas fuel in tangential furnace producing saturated steam which is superheated in coils in fluidized bed of kiln.	Auxiliary heat supplies 20%, waste heat 80% of heat for all needed superheated steam.
Waste neutralization	Water jet nozzles	Du Pont Co. Deepwater Point, N. J.	Waste lime sludge from acetylene plants is sluiced down with water jets to a reservoir, then pumped to neutralizing tanks to neutralize acid wastes.	New lime source, practically free, is equally as effective as pebble lime.
Waste solids recovery	Gibbs flotation unit	Gelatine manufacturer New England	Protein particles recovered from gelatine plant. Waste waters, otherwise non-washable, can be acid and water washed in additional Gibbs units.	Flotation agents not needed; entrained air bubbles float fine solids to surface for skimming. Increases gelatine yield nearly 2%.
Water treatment	Reuse of sewage effluent	Coden Petroleum Co. Big Spring, Tex.	Refinery water supplied by sewage effluent from municipal treatment plant. Quality better than scale-forming well water.	In operation.
X-ray inspection			First prototype of the newest X-ray development, xeroradiography. This technique uses static electricity to produce an image on a coated aluminum plate.	Development of research by General Electric and Haloid. Under test by Alcoa.
X-ray inspection	Portable	Argonne National Laboratory Illinois	A small portable X-ray unit has one-fifth gram of thulium-170 as the active component. It is comparable to a 100,000-volt X-ray machine.	Developed by Argonne National Laboratory; in use at the laboratory.





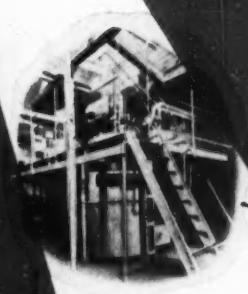
**a single source for..**



**Custom  
Fabrication**



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And Construction**



**Complete  
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Service**

## **INDUSTRIAL PROCESS ENGINEERS**

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ENGINEERING, DESIGN, FABRICATING  
OF PROCESSING PLANTS AND EQUIPMENT

**A Better Source Because It Offers All Three**

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**Inventory of New Chemicals and Materials ...**

... Here's your reference digest of 252 chemical products commercialized last year. They're screened for their interest to chemical engineers.

**• Agricultural Chemicals****Defoliant, Alkyl Phenols**

Replaces straight pentachlorophenol. (94A)

... Alphenol, concentrate of alkyl phenols, effectively removes plant foliage. It's available as both a 90% oil-soluble concentrate and a 45% con-

centrate which mixes with oil and water or water alone. Defoliation aids mechanical harvesting.—Great Lakes Solvents, Inc., Chicago, Ill.

**Desprouter**

For spraying on vegetables before harvesting. (94B)

... MH-40, containing 40% active maleic anhydride, is a growth regulator that controls sprouting of stored potatoes and edible onions if sprayed on before vegetables are harvested. Use is approved by U. S. Dept. of Agriculture. Actual increase in storage life depends on crop variety: sweet Spanish

onions stored as long as eight months with treatment; potatoes don't sprout for 12 months at 55 F. after treatment. Chemical is sprayed on onions 1-2 weeks before harvesting, on potatoes 4-5 weeks before harvesting.—Naugatuck Chemical Div., U. S. Rubber Co., Naugatuck, Conn.

**Desprouter**

For dusting on stored potatoes. (94C)

... Fusarex, 2, 3, 5, 6-tetrachloronitrobenzene, inhibits potatoes sprouting in winter storage. 200,000 bushels of newly-dug potatoes that had been

dusted and stored for six months were found relatively free of sprouts.—Sterwin Chemicals Inc., New York 18, N. Y.

**Fertilizer**

Contains four times as much nitrogen as conventional products. (94D)

... Arcadian 12-12-12, a high-analysis crop fertilizer, cuts farm production costs. Since each granule of product contains a minimum of 12% each of nitrogen (4 times as much as conventional 3-12-12 fertilizers), available phosphoric acid and potash, only one

application is required instead of two with lower analysis fertilizer. Results are quick and long-lasting because 12-12-12 contains half the nitrogen as ammonia and half as nitrate.—Nitrogen Div., Allied Chemical & Dye Corp., New York 6, N. Y.

## What It Contains...

This is CE's first annual inventory of new chemicals and materials developed or announced during the second six months of 1953 and the first six months of 1954. It covers 252 new or newsworthy chemical products carefully screened by CE editors for publication in the Product News department of *Chemical Engineering*. It includes only those developments of major significance or prime interest to chemical engineers in the chemical process industries. It is not, nor is it intended to be, a catalog of research chemicals, specialty chemicals or consumer-type products of prime interest to the analytical or research chemist or to the market researcher in consumer products.

## For More Information...

Most of the products — except organic chemicals — in this inventory have been placed into categories describing their major end uses. Since each new product has been listed only once, you may find it necessary to consult several end-use categories to find a particular product. For more information on any item, simply write its code number on one of the Reader Service postcards beginning on p. 35, then mail to us. Information comes to you direct from the manufacturer. You can also write directly to the producer or refer back to past issues of *Chemical Engineering* for full details, using the annual index in December or the monthly index in the Product News department.

### Fungicides, Organo-Metallic

Oil-soluble; form stable emulsions without stirring. (95A)

... Group of fungicides known as emulgates are emulsifiable concentrates applied as oil-in-water emulsions after dilution with large amounts of water. No mechanical stirring, stickers or spreaders are required. Emulgates carry

in solution, singly or combined, aromatic or aliphatic compounds of such metals as cadmium, cobalt, copper, manganese, mercury, silver, zinc.—H. L. Wouldhuysen & Associates, New York, N. Y.

### Herbicide

Applied to soil before grasses start to grow, prevents germination. (95B)

... Good to excellent results are reported by state testing services on CIPC—isopropyl n-(3-chlorophenyl) carbamate. Unlike other herbicides product is applied to soil before grasses start to grow, preventing them

from germination.—Columbia-Southern Chemical Co., Pittsburgh 22, Pa.; U. S. Industrial Chemicals Co., New York 5, N. Y.; Monsanto Chemical Co., St. Louis 4, Mo.; Pittsburgh Agricultural Chemical Co., Pittsburgh, Pa.

### Herbicide

Controls deep-rooted perennial weeds. (95C)

... Tests by State and Federal experiment stations indicate that phenyldimethyl urea effectively controls growth of bindweed, crab grass, Johnson grass and Bermuda grass. Concen-

tration of phenyldimethylurea is reduced to innocuous levels in the soil in a reasonable period of time.—E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

### Insecticide, Systemic

Leaves no harmful residues. (95D)

... Octamethylpyrophosphoramide (OM-PA Schraden) is a systemic insecticide used to control aphids and mites on cotton, leaving plant free of

harmful residues and without harming beneficial insects.—Monsanto Chemical Co., Organic Chem. Div., St. Louis, Mo.

### Insecticide Base

Effective against household, agricultural pests. (95E)

... Strobane, chlorinated mixture of terpene hydrocarbons, is available for test purposes in aerosols, space sprays, surface sprays. Tests show 0.5% concentration gives optimum results, but knockdown agents such as pyrethrins

are needed in the formulation. No aerosol difficulties encountered even in concentrations up to 5%. No aromatic solvent needed to hold Strobane in solution.—B. F. Goodrich Chemical Co., Cleveland, Ohio.

### Nitrogen Solution

Safe, economical way to apply supplemental nitrogen. (95F)

... Sodan is first direct application nitrogen solution for agricultural use to contain nitrate of soda. This ingredient gives crops vigorous growth, increased yield and ability to resist bad

weather. Sodan can be sprayed on pastures, small grains and row crops such as corn and cotton.—Nitrogen Div., Allied Chemical & Dye Corp., New York 6, N. Y.

## AGRICULTURAL CHEMICALS . . .

**Soil Conditioner**

To replace minerals lost through natural soil erosion. (96A)

. . . Magnite is "a concentration of the cream of natural erosion." Rebuilding soil, not feeding plants, is its main purpose. Magnite aerates the soil, im-

proves tilth without disturbing natural organic life, lowers soil freezing point 4 to 10 degrees F.—Western Mines, Inc., Denver, Colo.

**Weed Killer**

Equals 2, 4-D's power; safe for cotton. (96B)

. . . Weed and brush killer is silvex, trichlorophenoxypropionic acid. Major advantage over such herbicides as 2, 4-D: cotton shows no harmful effects

when silvex is deliberately applied at rates well above the minimum injurious rate for 2, 4-D.—Dow Chemical Co., Midland, Mich.

● **Bonding Agents****Adhesive**

Pressure-sensitive plastic bonds Teflon, resists nearly all acids, alkalis. (96C)

. . . Teflon can be joined to metals, glass, paper or to itself with Flexrock No. 80. Pressure-sensitive adhesive has good acid and alkali resistance, good weathering properties. Effectiveness is maintained over temperature range of

— 67 to 392 F. It's affected by most organic solvents. Teflon-to-Teflon peel strengths of 2 lb. per in. of width, and shear strengths of 12-15 psi. are developed.—Flexrock Co., Philadelphia 2, Pa.

**Adhesive**

Bonds copper to plastics, simplifies printed circuit manufacture. (96D)

. . . R & A Plymaster is a copper-plastic adhesive that yields over 400% increased bond strength: up to 35 psi. for copper-to-thermosetting sheets. Use of Plymaster can cut production steps in printed circuit manufacture by 75%. Adhesive is supplied precoated on Ana-

conda electrolytic sheet copper. Two basic formulations of R & A Plymaster are available: Type N for bonding copper sheet to phenolic resin base, Type E for epoxy or silicone base laminates.—Rubber & Asbestos Corp., Bloomfield, N. J.

**Adhesive, Emulsion**

Gives heat-resistant bonds to paper. (96E)

. . . An emulsion adhesive, ARCCO 1294-31L, provides strong, heat-resistant bonds to paper, fabrics, leather, other surfaces. It is ideal for users who

don't have high curing temperatures available. Mild heat can be used, but is not necessary.—American Resinous Chemicals Corp., Peabody, Mass.

**Adhesives**

For plywood and furniture industries. (96F)

. . . Two liquid urea resin adhesives with high rates of reactivity in hot press, wood-gluing operations are Lauxite UF-F01A and UF-112. The two glues contain 60 and 65 percent solids, respectively. In hot press operations, cycles have been obtained which are

faster than those ever before attained, resulting in average production increase of about 25%. Lauxite ureas are especially designed for use in urea-melamine resin adhesive mixtures.—Plastics Div., Monsanto Chemical Co., Springfield, Mass.

**Cement**

For nylon parts; non-brittle. (96G)

. . . Tough, nonbrittle cement, designed to bond nylon parts together, is Nylaweld. It can be applied by brushing, dipping or spraying to pro-

duce essentially invisible joints with no degradation under exposure to boiling water or caustic.—Polymer Corp. of Pennsylvania, Reading, Pa.

**Cement, Resin**

Resists acids, alkalis, solvents, salts. (96H)

. . . Improved resin cement exhibits complete resistance to alkalis, acids, solvents, salts at temperatures as high as 375 F. Product also possesses su-

perior rheological properties that will minimize construction delays.—Atlas Mineral Products Company, Mertztown, Pa.

**Cement, Vinyl Base**

Requires no acid or alkaline setting agents. (96I)

. . . Vinyl base cement, Vitroplast, is resistant to acids (HCl, H<sub>3</sub>PO<sub>4</sub>, 65% H<sub>2</sub>SO<sub>4</sub>, 5% HNO<sub>3</sub> and 5% H<sub>2</sub>CrO<sub>4</sub>), sodium hypochlorite, benzene and gasoline up to 150 F. Unlike standard

chemical resistant resin cements, product doesn't require acid or alkaline setting agents. It resists oxidizing conditions from pH 1 to 11.—Atlas Mineral Products Co., Mertztown, Pa.

**Cement for Plastic**

Gives high strength bonds, requires no heat for application. (96J)

. . . CD Cement 300, waterproof, high heat-resistant adhesive, has exceptional strength and durability, is thermosetting, self curing, requires no heat. Final glue line is resistant to salt and fresh water, fungus, acids, solvents, lu-

bricating oils. Neutral when cured, won't decay cellulose fibers. Used for bonding nylon, phenolic and urea plastic sheets to themselves and other surfaces.—Chemical Development Corp., Danvers, Mass.



# Which of these Fluorine Compounds do you need?

☒ for process uses

☒ for research

## FLUORINE Elemental Fluorine

### ACIDS

Fluoboric Acid  
Fluosulfonic Acid  
Hydrofluoric Acid, Anhyd.  
Hydrofluoric Acid, Anhyd. High Purity  
Hydrofluoric Acid, Aqueous Tech.  
Hydrofluoric Acid, Aqueous, Purif. & Reag.

### ACID FLUORIDES

Ammonium Bifluoride  
Potassium Bifluoride  
Sodium Bifluoride

### ALKALI FLUOBORATES

Ammonium Fluoborate  
Potassium Fluoborate  
Sodium Fluoborate

### ALKALI FLUORIDES

Ammonium Fluoride  
Potassium Fluoride, Cryst. & Anhyd.  
Sodium Fluoride, Tech.  
Sodium Fluoride, Reagent

### DOUBLE FLUORIDES

Chromium Potassium Fluoride  
Potassium Ferric Fluoride  
Potassium Titanium Fluoride  
Potassium Zirconium Fluoride  
Sodium Zirconium Fluoride  
Sodium Silico Fluoride  
Potassium Aluminum Fluoride

### METAL FLUORIDES

Aluminum Fluoride  
Aluminum Fluoride, Crystal  
Antimony Trifluoride  
Antimony Pentafluoride  
Barium Fluoride  
Cadmium Fluoride  
Calcium Fluoride  
Chromium Trifluoride  
Cupric Fluoride  
Ferric Fluoride  
Lead Tetrafluoride  
Magnesium Fluoride (Not Optimal Grade)  
Mercuric Fluoride  
Manganese Trifluoride  
Molybdenum Hexafluoride  
Nickelous Fluoride  
Selenium Hexafluoride  
Silver Difluoride  
Strontium Fluoride  
Titanium Tetrafluoride  
Tellurium Hexafluoride  
Tungsten Hexafluoride  
Zinc Fluoride  
Zirconium Tetrafluoride

### NON-METALLIC FLUORIDES

Boron Fluoride Gas  
Boron Fluoride Ether (Diethyl) Complex

Boron Fluoride Phenol Complex  
Boron Fluoride Ammonia Complex  
Boron Fluoride Diacetic Acid Complex  
Boron Fluoride Di-n-Butyl Ether Complex  
Boron Fluoride Dihydrate  
Boron Fluoride Piperidine Complex  
Boron Fluoride Ethyl "Cellosolve" Complex  
Boron Fluoride Hexamethylene-tetramine Complex  
Boron Fluoride Monoacetic Acid Complex  
Boron Fluoride Para-cresol Complex  
Boron Fluoride Triethanolamine Complex  
Boron Fluoride Urea Complex  
Sulfur Hexafluoride

### METAL FLUOBORATE SOLUTIONS

Cadmium Fluoborate  
Chromium Fluoborate  
Cobalt Fluoborate  
Copper Fluoborate  
Ferrous (Iron) Fluoborate  
Indium Fluoborate  
Lead Fluoborate  
Nickel Fluoborate  
Silver Fluoborate  
Stannous (Tin) Fluoborate  
Zinc Fluoborate

### HALOGEN FLUORIDES

Bromine Trifluoride  
Bromine Pentafluoride  
Chlorine Trifluoride  
Iodine Pentafluoride

## GENETRON® ORGANIC FLUORINE COMPOUNDS

### Fluoromethanes

Trichloromonofluoromethane  $\text{CCl}_3\text{F}$   
Dichlorodifluoromethane  $\text{CCl}_2\text{F}_2$   
Monochlorodifluoromethane  $\text{CHClF}_2$   
Trifluoromethane (Fluoroform)  $\text{CHF}_3$   
Monochlorotrifluoromethane  $\text{CClF}_3$

### Fluoroethanes

Difluoroethane (Ethylidene fluoride)  $\text{CH}_3 \cdot \text{CHF}_2$   
Difluoromonochloroethane  $\text{CH}_3 \cdot \text{CClF}_2$   
Tetrachlorodifluoroethane  $\text{CCl}_3 \cdot \text{CClF}_2$   
Monochlorotrifluoroethane  $\text{CH}_3\text{Cl} \cdot \text{CF}_3$   
Trichlorotrifluoroethanes  $\text{CCl}_3\text{F} \cdot \text{CClF}_2$   
 $\text{CCl}_3 \cdot \text{CF}_3$

Dichlorotetrafluoroethanes  $\text{CClF}_2 \cdot \text{CClF}_2$   
 $\text{CCl}_2\text{F} \cdot \text{CF}_3$

Monochloropentafluoroethane  $\text{CClF}_2 \cdot \text{CF}_3$

### Fluoroethylenes

Difluoroethylene (Vinylidene fluoride)  $\text{CH}_2 = \text{CF}_2$   
Dichlorodifluoroethylene  $\text{CCl}_2 = \text{CF}_2$   
Trifluorochloroethylene  $\text{CClF} = \text{CF}_2$   
Monochlorodifluoroethylene  $\text{CHCl} = \text{CF}_2$

### Fluorobromoethanes

Dibromodifluoroethane  $\text{CH}_2\text{Br} \cdot \text{CBrF}_2$

### Fluorinated Acetic Acids and Anhydrides

Dichloromonofluoroacetic acid  $\text{CCl}_2\text{FCOOH}$  and  
and anhydride  $(\text{CCl}_2\text{FCO})_2\text{O}$   
Monochlorodifluoroacetic acid  $\text{CClF}_2\text{COOH}$  and  
and anhydride  $(\text{CClF}_2\text{CO})_2\text{O}$

### Fluorinated Acetones

Tetrachlorodifluoroacetone  $\text{CCl}_3\text{F} \cdot \text{CO} \cdot \text{CCl}_2\text{F}$   
Trichlorotrifluoroacetone  $\text{CCl}_2\text{F} \cdot \text{CO} \cdot \text{CClF}_2$   
Dichlorotetrafluoroacetone  $\text{CClF}_2 \cdot \text{CO} \cdot \text{CClF}_2$

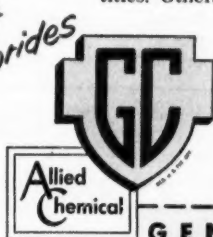
### Various Other Organic Fluorine Chemicals

Through aggressive research and development, General Chemical sets the pace in fluorine chemistry . . . making more and more of these versatile chemical "tools" available so that your development program today can become tomorrow's production.

Listed here are a hundred organic and inorganic fluorine compounds which General presently offers. Many are produced in carload, tank car or other commercial quantities. Others are made in pilot plants or intermittently on a laboratory scale for experimental uses. For some of these, studies of properties are in early stages. General has a number of other fluorine products under investigation in addition to those on the list; thus the company is geared to serve you well—now—and in the future.

That's why it's wise to see General Chemical when your work indicates the need for fluorine chemicals. With fifty year's experience in the field, we may be able to save you time, money and effort.

For more information use the handy coupon.



## GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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☐ I am interested in using this product for \_\_\_\_\_

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Address \_\_\_\_\_

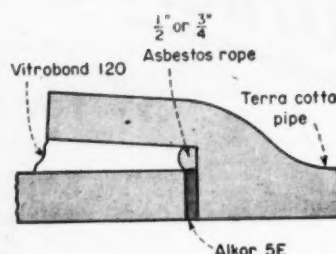
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## BONDING AGENTS . . .

### Corrosion-Proof Bond

Cement combination gives chemically resistant pipe joint. (98A)

. . . Vitrified clay pipe joints that resist nearly all corrosive agents can be made easily by using Alkor 5E chemical resistant cement and Vitrobond 120, a bonding cement. Alkor 5E, based on polymer of furfuryl alcohol, protects against all alkalis, non-oxidizing acids, solvents, greases up to 375 F. Inexpensive Vitrobond 120 supplies most of bonding action, lowers overall cost of joint. Heat of molten Vitrobond accelerates setting of Alkor cement.—Atlas Mineral Products Co., Mertztown, Pa.



### Latex Adhesive

Pressure sensitive to like adhesive films. (98B)

. . . Syntex L-852 is an unusual latex adhesive that's pressure sensitive to a like adhesive film, but not to uncoated surfaces, for periods up to a month.

Water base product can be brushed or sprayed on porous or semiporous materials.—Flintkote Co., New York 20, N. Y.

### Plastic to Glass

Chemically join glass to plastic; bonds have high strength. (98C)

. . . Chlorosilane compounds bind plastic and glass fiber reinforcement together by chemical combination. Laminates are less likely to separate upon continued vibration or flexing. Num-

bering five in all, binders are allyltri-chlorosilane and its reaction products with resorcinol, phenol, *m*-cresol and xylene.—Naval Ordnance Laboratory, Silver Springs, Md.

### Pressure Adhesives

Bond plastic to wood, steel or composition surfaces. (98D)

. . . Two pressure-contact adhesives—one for the professional, one for the inexperienced—permit easier, cheaper bonding of plastics to surfaces in the home. Unlike conventional bonding methods requiring presses or clamps, two adhesives permit easy rolling with linoleum roller or its equivalent. Samples of GE Textolite plastics bonded

to wood and steel—and left to hang for 2 yrs. with 50 lbs. dead lead per sq. in.—showed no noticeable failure or heat fatigue. Type A is made for professional bonding. Type B is designed for do-it-yourself use on wood surfaces. It's easier for an inexperienced person to handle.—General Electric Co., Coshocton, Ohio.

### Primer

For plastic taping; doubles tape-to-pipe adherence. (98E)

. . . Roybond A-36 primer increases adherence of plastic tape to pipe by 100%. A polar, synthetic rubber-resin, Roybond is compatible with asphalts,

coal tar and rubber-type synthetics, will withstand wide temperature variations.—Royston Laboratories, Inc., Pittsburgh 38, Pa.

### Resin

Gives silicone-glass laminates flex strength of 50,000 psi. at room temperature before curing. (98F)

. . . Low-pressure silicone-glass laminates, possessing initial strength and stiffness values approaching those of organics, are produced with bonding resin, Dow Corning 2106. Typical  $\frac{1}{8}$  in. samples (30% resin, heat cleaned 181 cloth) show flexural strengths in range of 50,000 psi. at room tempera-

tures even before curing. Flex strength of 10,000 psi. at 500 F. is reached in 6 hrs., indicating that 2106-bonded laminates can often be cured while they are in service. Optimum properties are obtained after treating about 80 hr. at 480 F.—Dow Corning Corp., Midland, Mich.

### Resin Cement

Low porosity furane. (98G)

. . . Resiment, furane resin cement, sets quickly by internal chemical reaction. It's used as mortar for acid brick or tile in corrosion-resistant tank lin-

ings, floors, sewers and towers up to 375 F. Has high compression and tensile strengths.—Delrac Corp., Watertown, N. Y.

### Tackifiers

For fast-breaking emulsion adhesives. (98H)

. . . Two resin emulsion tackifiers, Arccos 25 and 26, designed to produce fast-breaking emulsion adhesives, develop properties without loss of emul-

sion stability. First use will be with natural and synthetic rubbers.—American Resinous Chemicals Corp., Peabody, Mass.

## • Lubricants

### Cleaner

Lubricates, too. (98I)

. . . Technilube lubricant cleaner de-rusts without harming the metal, cleans and lubricates simultaneously. Product

prevents clogging and sticking of small moving parts.—Zel-Tex Chemical Co., San Francisco, Calif.

**Coolant**

For machine tool operations; water soluble; oil free. (99A)

... Dypral, general-purpose coolant, permits greatly increased speeds and feeds in machine tool operations on metals and plastics. Though coolant is water soluble and oil free, it meets most cooling requirements for cutting, sawing, grinding. Solution is odorless,

doesn't smoke or become rancid during use, and does not lose efficiency through cutting or frictional heat. Parts which have been machined using this coolant are clean, need not be degreased.—Dynamic Industrial Products, Inc., Danbury, Conn.

**Cutting Fluid**

Contains no oil, is water soluble. (99B)

... Tuff-Kut 77 is a phosphorous compound used as cutting fluid for machining and grinding that can stand water. It can displace usual sulfurized

and mineral oils. A translucent emulsion, Tuff-Kut is non-corrosive, non-toxic and stable.—Lubricants Inc., Detroit 6, Mich.

**Grease**

Solvent-resistant. (99C)

... A solvent-resistant grease, called Lubricant A-9, is recommended for use in bearings, glands for solvent pumps and valves. It's impervious to any hy-

drocarbon liquid or gas, and to chlorinated solvents from 20 to 400 F.—Keystone Lubricating Co., Philadelphia 32, Pa.

**Grease**

Lubricates from -65 to 125 F. (99D)

... Texaco All Temp Grease performs effectively in desert or arctic operations, will simplify transportation of vehicles from extremely cold to extremely hot locations. Grease also has excellent

shear stability, good rust and corrosion protection for metal parts, capacity to perform well even when contaminated with water.—The Texas Co., Houston, Tex.

**Motor Oil**

For below 10 F. (99E)

... Gulfpride H. D. Light permits easy starting down to -30 F. but provides adequate lubrication on warm winter

days. H. D. Light will completely replace Gulf's 5W and 10W grades.—Gulf Oil Corp., Pittsburgh 30, Pa.

**Motor Oil**

Good for all seasons. (99F)

... D-X Special can be safely used where SAE 5W, 10W, 20W and 20 motor oils are recommended. It provides quicker starting and free-flowing

lubrication down to -30 F., yet equals performance of SAE 20 motor oil in warm summer driving.—Mid-Continent Petroleum Corp., Tulsa, Okla.

**Motor Oil**

Doesn't thicken when cold, or thin if hot. (99G)

... An all-weather motor oil, Perm-lube Motor Oil SAE 5W-20, flows more freely than many 5W and 5W-10W cold weather motor oils even at

sub-zero temperatures and has increased anti-rust and anti-score properties.—Standard Oil Company (Indiana), Whiting, Indiana.

**Rust Inhibitor**

Protects ferrous surfaces when added to lubricating oils. (99H)

... Atpet 100, rust-inhibiting oil additive for ferrous surfaces, will protect stored aircraft engines, diesel and gasoline engines, turbines and iron tools. A sorbitan mono fatty acid ester, it's shipped as a concentrate, has performance and economy advantages over a

similar product produced by manufacturer, Span 80. One percent of Atpet 100 in oil withstands 634 hr. exposure, nearly double that of earlier inhibitors. Inhibitor provides freedom from ashy residues.—Atlas Powder Co., Wilmington 99, Del.

## Your Inventory of New Chemicals and Materials

### What It Contains . . .

This inventory digests some 252 of the most important new, improved or newsworthy chemical products developed or commercialized during the second six months of 1953 and the first six months of 1954. It includes only those products of major signifi-

cance or prime interest to chemical engineers in the chemical process industries.

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## LUBRICANTS . . .

### Sludge Preventive

Methacrylate polymers sequester sludge, help keep fuel oils and lubricants clean. (100A)

. . . Two oil-soluble chemical additives can act as points of attraction for sludge-like materials, prevent them from settling out. Copolymer S (4:1 of lauryl methacrylate to diethylamino ethyl methacrylate), in concentrations of between 0.0015 and 0.01%, suppresses formation of insoluble residue in fuel oils for first 4-6 months of storage. Though amount of residue after

18 months equals that accumulated in untreated oil, Copolymer S-treated oil does not clog fuel burner screens. Copolymer D (another methacrylate) controls varnish and sludge formation in lube oils used in high-temperature work, is even more effective at low temperatures encountered in normal automobile operation.—E. I. du Pont de Nemours & Co., Wilmington 98, Del.

## • Maintenance Chemicals

### Cleaners, Boiler

Clean completely without shutdown or failure. (100B)

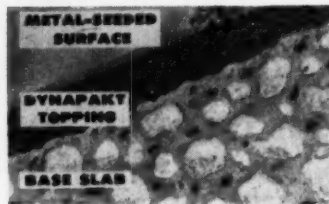
. . . Series 31-H Formulas are non-chemical, colloidal boiler cleaners. They hold scale, oil, grease in suspension, keep operation-interrupting deposits

from forming. Tests show cleaning in 30-40 days without shutdown or failure.—Water Treatment Co. of America, Pittsburgh 12, Pa.

### Concrete Floor Strength

Iron-chip veneer guards concrete, stops spalling and crumbling. (100C)

. . . Industrial flooring process, Metal-Seeded Dynapak, adds strength of iron to heavily traveled concrete. Process features an  $\frac{1}{8}$  in. layer of ironchip aggregate as a non-spalling, non-crumbling, non-slip armor over concrete. Special heavy-duty equipment does flooring, insures maximum compactness and adhesion.—Flash Stone Co., Inc., Philadelphia 44, Pa.



### Fire Extinguisher, Chlorobromomethane

1.5 to 6 times as effective as other liquid extinguishers. (100D)

. . . Chlorobromomethane, "CB," is faster, less toxic than other fire extinguishing chemicals, has low freezing point ( $-123^{\circ}\text{F.}$ ). Extinguishers using "CB" can be smaller, lighter, give less soot, corrosive fumes, flash back when

used on waste fires, have almost no corrosive effect on steel, brass or lead unless mixed with  $\text{H}_2\text{O}$ . Can be pressurized with Freon,  $\text{CO}_2$ , and  $\text{N}_2$ , or air.—Michigan Chemical Corp., St. Louis, Mich.

### Fire Extinguisher, Methylene Chlorobromide

Better than  $\text{CCl}_4$ . (100E)

. . . Methylene chlorobromide, commonly referred to as CB, is fire extinguishing agent several times as effective as carbon tetrachloride, with a much

lower level of toxicity. Most new Air Force planes use CB.—Easton Chemicals Div., American Potash & Chemical Corp., Los Angeles, Calif.

### Floor Paint, Nonskid

Prevents industrial accidents. (100F)

. . . A plastic liquid, incorporating a large amount of hard grit, can be brushed on floors to give a rough surface that prevents falls even when wet.

Sure-Grip requires no primer, is effective over wood, metal or concrete.—Colonial Refining & Chemical Co., Cleveland, Ohio.

### Inhibitor, Cleaner-Corrosion

For cleaning iron and steel cargo tanks. (100G)

. . . Nitrox is combination cleaner-corrosion inhibitor, can clean iron and steel cargo tanks and other containers which handle light hydrocarbons, inedible oils, solvents and inorganics. Nitrox com-

bines efficient cleaning action of caustic soda with inhibiting action of sodium nitrate.—Solvay Process Div., Allied Chemical & Dye Corp., New York 6, N. Y.

### Packing Compound

Negative pressures. (100H)

. . . Molyvec is self-molding packing compound for valves and pumps operating under negative pressure. It main-

tains sealing efficiency at temperatures from  $-30$  to  $500^{\circ}\text{F.}$ —Surveys, Inc., Trenton 9, N. J.

### Scale Remover

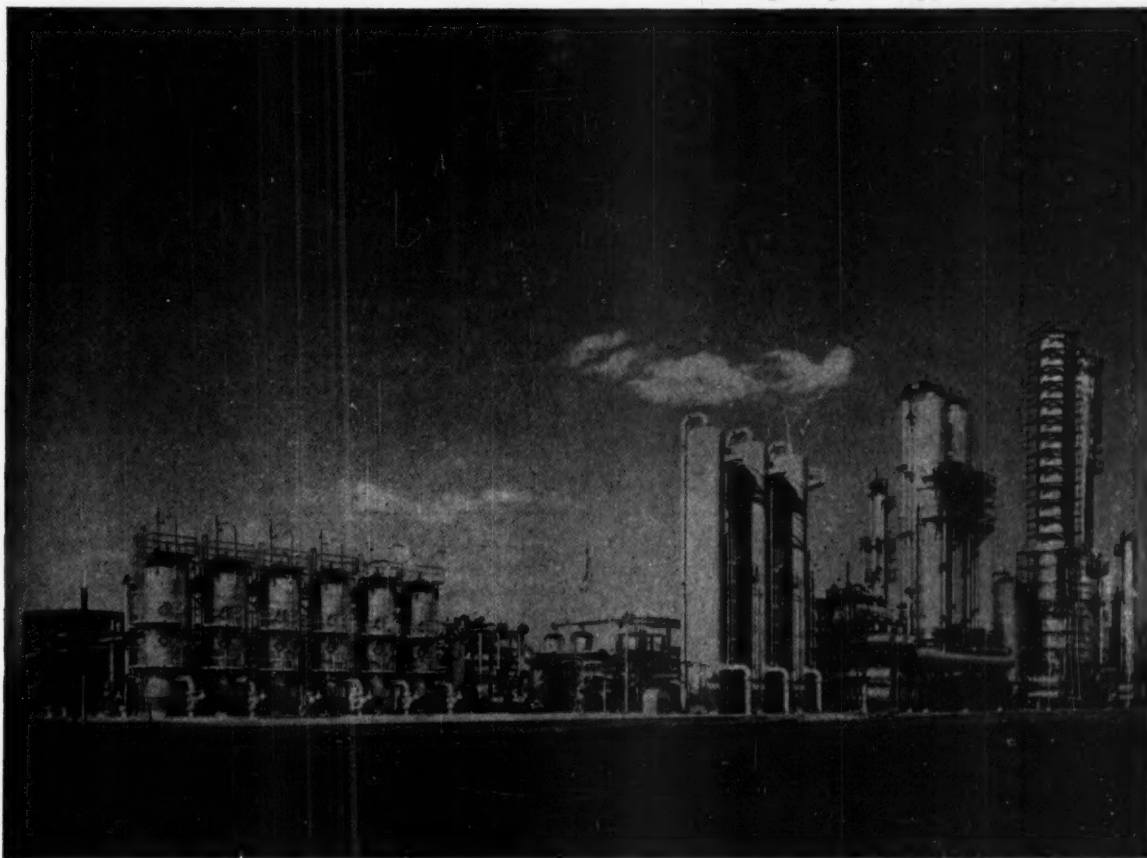
For boiler use. (100I)

. . . In plant use B compound is proving successful in combatting scale arising from steam generation. Liquid metal in compound blends with iron, becomes part of metal itself. Another com-

ponent removes existing scales and keeps any from being formed by same action. pH of B compound is about 7.4—Edward N. Jones, Consulting Engineer, Pettus, Tex.



# Petro starts construction work on polyethylene plant



NATURAL GAS EXTRACTION UNIT

The emergence of National Petro-Chemicals Corporation in 1955 as a large scale polyethylene producer will be a natural outgrowth of the entire Petro operation. From pipeline gas to polymer, the plant at Tuscola, Illinois will be an integrated unit processing ethane to ethylene to polyethylene. Only in this way can continuity of supply be assured, and quality controlled in full.

The polyethylene plant is being constructed by The M. W. Kellogg Company, and is based on a process developed by ICI and modified by Petro to fit specific conditions. Recycling of gases is eliminated to insure a product of the highest quality.

A new process control, product application and research laboratory is also under construction at Tuscola

to augment present knowledge and to improve product and process after production gets underway. These facilities are designed for prompt, efficient service to polyethylene users in their processing problems.

This new product, "Petrothene", will be available in June, 1955. From the centrally located plant, immediate shipments can be made to any part of the country—direct by truck or rail. Bulk shipments will also be handled.

Because Petro believes in the future of polyethylene, the unit has been geared to a three to four-fold production increase. As new uses are developed, this additional production will be needed, and Petro will be there to serve your expanding markets.

"PETROTHENE"... THE POLYETHYLENE OF TOMORROW

## NATIONAL PETRO CHEMICALS

C O R P O R A T I O N

*A joint enterprise of National Distillers Products Corporation and Panhandle Eastern Pipeline Company*

120 BROADWAY, NEW YORK 5, N. Y.

## MAINTENANCE CHEMICALS . . .

**Skin Cream, Industrial**

Protects against dermatitis; non-sensitizing; non-initiating. (102A)

. . . Kerodex, a skin cream designed to act as a barrier between skin and irritants is now available to American industry. Its prime function: to keep skin pores and follicles free of foreign matter. Other features: doesn't affect materials handled, and is unaffected by

them; is economical and easily applied; protects for three or four hours. Kerodex guards against contact dermatitis caused by acids, alkalis, solvents, oil, nickel, chromates. One grade deflects ultraviolet and infrared rays.—Ayerst Laboratories, New York 16, N. Y.

**Slime Preventive**

Holds up solids usually found in water instead of depositing them. (102B)

. . . Vapco Preventive is used in forced draft cooling towers or condensers with small sump tanks relative to the amount of water being evaporated. When used in new water cooling equipment, or in old equipment conditioned by new

Vapco Slime-X and Vapco Cleaner, Vapco Preventive will not harm wood or metals or discolor water, and contains chemicals to inhibit slime and algae.—Garman Co., Inc., St. Louis, Mo.

**Solvents, Safety**

Replace carbon tet in specialized cleaning operations. (102C)

. . . Three safety solvents are all non-combustible, of comparatively low toxicity and close to carbon tetrachloride in speed of evaporation. Cineclene and Oxytene M-6: for cleaning oxygen sys-

tems and equipment. Furfasol M-17: to replace acetone and MEK in cleaning latex and resin adhesive products from process equipment.—John B. Moore Corp., Nutley 10, N. J.

**Solvent, Safety**

High flash point. (102D)

. . . Formula 602, cleaner for motors and electrical equipment, combines low toxicity and high flashpoint (135 F.).

Laboratory tests proved it's 24 times less toxic than carbon tetrachloride.—Penetone Co., Tenafly, N. J.

**Solvent, Safety**

High-flash, quick-drying cleaner for electrical equipment. (102E)

. . . Turco-Solv, quick-drying safety solvent, cleans electrical wiring, fuses and motors. It's a combination of least toxic solvents available, consistent with safety fire hazards. Typical uses include removing grease pencil, ink from motor

generators on a production line and in-plant maintenance cleaning where high-flash material is needed (Tag Closed Cup flash point over 200 F.). Turco-Solv is noncorrosive.—Turco Products, Inc., Los Angeles 1, Calif.

## • Organic Chemicals

**Acetoacet-m-xylylide**

From domestic production. (102F)

. . . Acetoacet-m-xylylide—usually imported—is more available now from domestic production. Yellow benzidine pigments prepared from this chemical

have remarkable light fastness, are used in printing inks, textiles.—Carbide and Carbon Chemicals Co., New York 17, N. Y.

**Acetonedicarboxylic acid**

Acid and its diethyl ester available in commercial quantities. (102G)

. . . Acetone dicarboxylic acid (ADA), because of its two active methylene groups forms symmetrical ring compounds containing nitrogen, oxygen and even benzene derivatives. It's used in Robinson synthesis of Atropine and

similar alkaloids, as well as for such products as pyrazolones and piperidones. Tests indicate that ADA ester may be useful in the production of allethrin-type insecticides.—Smith-New York Co., Freeport, N. Y.

**Amines**

For lubricant additives, corrosion inhibitors, emulsifiers. (102H)

. . . For first time, two unsaturated secondary amines are offered to industry for experimental use. Both products, Armeen 2S and Armeen 2T, are made from tallow and soya and can be

purchased in single drum lots. They are easier to liquefy than corresponding saturated amines and show better solubility in organic solvents.—Armour & Co., Chicago 9, Ill.

**Amyl Alcohols**

Guaranteed at least 95% primary; used in plasticizers, oil additives, esters. (102I)

. . . Synthetic amyl alcohols containing at least 95% primary isomers are available in tank car quantities. Mixture's primary isomer content is important from reaction rate and yield standpoints. Biggest potential use is as replacement for butyl alcohols in manufacture of plasticizers where amyls have

two advantages: lower vapor pressure, greater oil and hydrocarbon solubility. Other uses: oil additives, manufacture of alkyl xanthates as collectors in concentration of minerals, oil-soluble catalysts for resinification, alkyl adipates and sebacates.—Sharples Chemicals, Inc., Philadelphia 9, Pa.

# RESEARCH - PRODUCTION

Baker-developed Platinum Metals Catalysts provide by far the highest yield and catalytic activity at low temperatures and pressures—the purest end-product and most efficient production control. Industrial and pharmaceutical chemical manufacturers are also making the very profitable discovery that Platinum Metals catalysis is in many instances considerably more economical than catalysts of the base metals and oxides—in large as well as small-scale production. Certainly, the possibilities-for-advantage warrant investigation.

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## ORGANIC CHEMICALS . . .

**Butylene Oxide Isomers**

Highly reactive products will extend use of epoxide compounds. (104A)

. . . Commercial synthesis of straight chain butylene oxide isomers extends use of epoxide compounds in detergents, emulsifiers, plasticizers, intermediates, hydraulic fluids. Isomers come as mixture: mostly 1, 2-butylene oxide

with small amounts of cis- and trans-2, 3-butylene oxide, less than one per cent isobutylene oxide. The new material polymerizes readily to form polybutoxy compounds.—Dow Chemical Co., Midland, Mich.

**Butyrolactone**

Intermediate for aliphatic and cyclic compounds; general solvent. (104B)

. . . Butyrolactone is now available in tank-car quantities. Structurally the inner ester of gamma-hydroxybutyric acid, it's an intermediate for aliphatic and cyclic compounds. Has been used to make methionine and N-alkylpyrro-

lidones. Liquid from -44 to 204 C. Of special use as solvent for acrylonitrile and other high polymers and selectively for acetylene in natural gas and other gases.—General Aniline & Film Corp., New York 14, N. Y.

**Cellulose Derivative**

For use as thickener and surfactant. (104C)

. . . Methocel X-2602, a water-soluble thermoplastic hydroxypropyl methyl cellulose ether, can be used as thickener and surface active agent in plastics, gelatin, paint, ink, cosmetics and food.

It possesses excellent stability to light, air-aging, alkalis and weak acids. Toxicity is low enough for use in cosmetics and food.—Dow Chemical Co., Midland, Mich.

**Cellulose Polymers**

Have wide range of known applications; more are sought. (104D)

. . . Ethyl hydroxyethyl cellulose (EHEC-3U) is highly substituted, gives high-melting films. Soluble in hydrocarbons with KB values over 36: thickens inks, varnishes and liquid hydrocarbon mixtures. Carboxymethyl hydroxyethyl cellulose (CMHEC), insoluble in usual organic solvents, is soluble in water and resistant to pre-

cipitation by salts and ions: used in coatings, textile sizes, detergents. Hydroxyethyl cellulose (Natrosol) is insoluble in organic solvents, but soluble in water solutions of strong alkalis: textile finishes, coagulant, forms water-sensitive films, aids in alum clarification of water.—Hercules Powder Co., Wilmington, Del.

**Chelating Agent**

Controls trace trivalent iron over wide pH range. (104E)

. . . Versen-ol controls contaminating influence of trace iron. The trisodium salt of N-hydroxy-ethylethylenediamine triacetic acid, Versen-ol is extremely soluble in water, highly stable throughout pH range, forms 1:1 ferric chelates

and prevents hydrolytic decomposition, even in strongly alkaline solutions. Versen-ol remaining after chelating iron inactivates other heavy metals until exhausted.—The Bersworth Chemical Co., Framingham, Mass.

**Chlorobenzene Isomers**

More high purity grades available for evaluation. (104F)

. . . Add 1, 2, 3, 4- and 1, 2, 4, 5-tetrachlorobenzene (high-purity) to list of pure chlorobenzene isomers available. (Others are pure *ortho* isomer, 1, 2, 3- and 1, 2, 4-trichlorobenzene.) Latest compounds are available to researchers wishing to evaluate their reactions. Derivatives of 1, 2, 4, 5-tetrachlorobenzene have shown biological activity in several fields—plant hormones, bactericides. 1, 2, 3, 4-isomer has found use in heat ex-

change fluids for electrical transformers. Commercial quantities of *mono*, *ortho* and *para* isomers are made, plus pilot plant quantities—small drum lots—of other isomers mentioned. Manufacturer is making four other pure isomers on bench scale: 1, 3, 5-trichlorobenzene, 1, 2, 3, 5-tetrachlorobenzene, pentachlorobenzene and hexachlorobenzene.—Allied Chemical & Dye Corp., Solvay Process Div., Syracuse, N. Y.

**Coal Chemicals**

Hydrogenation derivatives available for research studies. (104G)

. . . Coal hydrogenation continues to yield unique aromatic chemicals that can serve as starting materials for organic syntheses. Most recent additions—available in small quantities for test purposes—are indole, indanol-4, indanol-5 and a premium grade of naphtha-

lene. Indole is basis for synthesizing indole-acetic acid and tryptophan, an amino acid. Naphthalene has a melting point above 80 C., negligible sulfur, and thianaphthene concentration of less than 0.5%. —Carbide and Carbon Chemicals Co., New York 17, N. Y.

**Fatty Acids, Modified**

Unlike any other fatty acids now commercially available. (104H)

. . . Makers of soaps, cosmetics, alcohols, greases and textile softeners can benefit from using three low-cost, modified fatty acids. These products have color and heat stability normally associated with palmitic and stearic acids but have consistency and solubility characteristics of distilled tallow fatty acids. Two acids, F-995-R and F-996-R are

essentially saturated C<sub>18</sub> and C<sub>16</sub> monocarboxylic acids—iodine values of 4 and 2, respectively. The third, F-994-R, has a polyunsaturated acid content of 0.5% and an iodine value of 34.5. In hydrocarbon systems, aluminum soaps of these acids possess outstanding gelling properties.—Emery Industries, Cincinnati 2, Ohio.



**Formaldehyde, Solid**

Replaces formaldehyde in processes where presence of water is a disadvantage. (105A)

... Superfyde, a solid formaldehyde with less than 0.1% water is similar to paraformaldehyde, but has higher mol. wt. and melting point, is slower acting. Applications: fumigant and fungicide where slow controlled evolution of gaseous formaldehyde is important; when very slow resinification and final hard-

ening by heating are desirable; source of dry formaldehyde in making chemical intermediates and resins; and many other organic reactions where the properties of formaldehyde are useful but its reaction is inhibited or prevented by water.—Heyden Chemical Corp., New York 17, N. Y.

**Glycerine Substitute**

For improved surface coatings. (105B)

... Production of trimethylol ethane (TME), a trihydric alcohol having advantages over glycerine, is under-way. It has all primary hydroxyl groups, speeds

up manufacture of alkyd resins, gives greater stability, durability to paints formulated with alkyds.—Heyden Chemical Corp., New York 17, N. Y.

**Glycol Ethers**

For high-boiling solvents, rewetting agents, antifoamers, chemical intermediates. (105C)

... First of two series of glycol ethers is made up of monomethyl and mono-octyl ethers of polypropylene and polyethylene glycols. They have average molecular weight of 600, with alkyl group on one end, hydroxyl group on other. Uses: high-boiling solvents, rewetting agents for paper products. Second series is a number of phenyl ethers

and substituted phenyl ethers of glycols. Called Dowanol 1-ethylene glycol phenyl ether and Dowanol 2B-propylene glycol phenyl ether, they have found use as high-boiling solvents, chemical intermediates for plasticizers and bactericidal agents, and as perfume fixatives.—Dow Chemical Co., Midland, Mich.

**Intermediates**

Allethrin derivatives used in specialty products. (105D)

... Five chemical intermediates from production of allethrin may have possible uses in synthesis of pharmaceuticals, perfumes, fungicides, insecticides. Intermediates are: allyl acetone; 2,5-dimethyl-hexane-2,5-diol; 2,5-dimethyl-2,4-hexadiene; ethyl- $\alpha$ -allylacetate; and ethyl diazoacetate derivatives. These are first of several chemicals to be derived from manufacturers' new allethrin plant. Ethyl diazoacetate has been widely used in various laboratory

syntheses. One of its many unique applications is the addition to aliphatic as well as aromatic double bonds to form cyclopropane derivatives. Commercial use of ethyl diazoacetate has, however, been retarded up to now by its relative instability and handling hazards. Now that extensive facilities have been designed to handle large quantities safely, its usage should broaden.—U. S. Industrial Chemicals Co., New York 5, N. Y.

**Isopropylaminoethanols**

High flash point. (105E)

... Isopropylaminoethanols, a blend of isopropyl mono- and diethanolamines, has mild odor, high flash point and low toxicity. Its oleate soaps show

high emulsifying and dispersing power, are effective at IPAE: oleic acid mole ratios as low as 1:1.—Sharpley Chemicals, Inc., Philadelphia 7, Pa.

**Ketones, Unsymmetrical**

For chemical intermediates, solvents; made from fatty acids. (105F)

... High molecular weight, unsymmetrical ketones are available in limited quantities: methyl heptadecyl, methyl undecyl and methyl heptyl. Other members of series expected later. All

believed to be useful as chemical intermediates, solvents, lubricants and plasticizers. These ketones are made synthetically from fatty acids.—Armour and Co., Chicago, Ill.

**Lauryl Sulfates**

Consistent quality at lower prices. (105G)

... Series of lauryl sulfates fills the need for good fatty alcohol sulfates of consistent quality, but at lower prices than those for cosmetic grades. Salts

offered are: sodium, magnesium, potassium, ammonium, mono-, di- and triethanolamine. —American Alcolac Corp., Baltimore 26, Md.

**Maleic Anhydride**

Briquettes. (105H)

... Maleic anhydride is now marketed in briquette form for use in synthetic resins, drugs, rubber chemicals, surface

active agents, plasticizers and stabilizers for vinyl plastics.—American Cyanamid Co., New York 20, N. Y.

**Methoxyethyl Thioglycolate**

For amides. (105I)

... Methoxyethyl thioglycolate is recommended for making substituted amides of thioglycolic acid or for syn-

thetic steps requiring alcoholysis. It boils at 112-113 C. at 23 mm.—Evans Chemetics, Inc., New York 17, N. Y.

 **$\alpha$ -Methylstyrene Dimers**

Nonsticking. (105J)

...  $\alpha$ -Methylstyrene dimers, a product for modifying polymerization reactions, is suggested as nonsticking agent in an-

nealing of metal products. It is readily soluble in many organic solvents.—Dow Chemical Co., Midland, Mich.

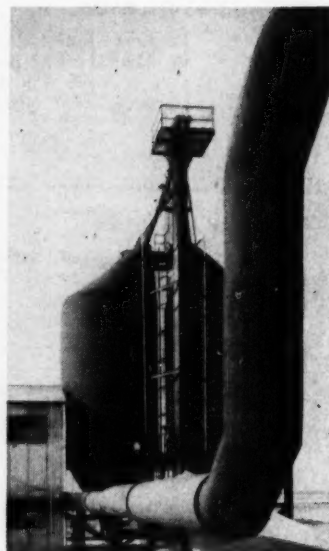


## ORGANIC CHEMICALS . . .

**Paraformaldehyde**

Low-cost; has wide industrial uses. (106A)

... Paraformaldehyde is now available as 91% crystallized formaldehyde—about 10 polyoxymethylene glycol groups—and 9% free and combined water. Paraform's biggest potential market is in production of phenolic, urea and melamine resins where its higher reactivity, resulting from lower molecular weight, gives higher resin yields. Other advantages over formalin in urea and phenolic resin manufacture: paraform eliminates necessity of shipping and processing large amounts of water (thus lowering shipping charges), cuts cycle times in half. Next biggest outlet for paraform is in oil field, where it preserves pregelatinized starch used for oil well drilling muds. Paraform rates consideration in reactions that need dry formaldehyde at prices competitive with formalin. Other applications include soap bactericides, ion exchange resins, demulsifiers, synthetic rubber, pharmaceuticals, vinyl resin plasticizers, terpene derivatives.—*Celanese Corporation of America, New York 16, N. Y.*

**Phenols**

Have a total phenolic content of about 90% by weight. (106B)

... New product of coal hydrogenation, Meta-Phenols 220, is available in tank car lots. Chemical is mixture of reactive cresols, xyenols and ethyl phenols with boiling range of 207-230 C. Meta-Phenols contains high

proportion of meta substitution. Average of approximately 2.2 ortho and para positions per molecule are open. Product will be useful as intermediate for phenolic resins.—*Carbide & Carbon Chemicals Corp., New York 17, N. Y.*

**Phenyl Phenol**

Purified form. (106C)

... o-phenylphenol, available as white flakes, is essentially odorless and tasteless, should find increased use as indus-

trial preservative where odor, taste, color are important.—*Dow Chemical Co., Midland, Mich.*

**Polyisobutylenes**

High molecular weights are available. (106D)

... Polyisobutylenes made in Germany are being sold here in molecular weights of 15,000, 50,000, 100,000, 150,000 and 200,000. It's the first U. S. appear-

ance for the last two polymers. All grades are useful in adhesive and rubber compounding.—*Nova Chemical Corp., New York 14, N. Y.*

**Polymeric**

Used in sealing formulations. (106E)

... Because it's a neutral, water-soluble colloid, the ammonium salt of the half amide of PVM/MA (methyl vinyl ether-maleic anhydride polymer) is sug-

gested for use in sealing formulations. Available as a white amorphous powder in car load lots.—*General Aniline & Film Corp., New York 14, N. Y.*

**Polymethoxy Acetals**

Good plasticizers, resin modifiers. (106F)

... Mixed, long-chain, polymethoxy acetals of varying viscosities are compatible with water-insoluble plasticizers and miscible with many organic liquids.

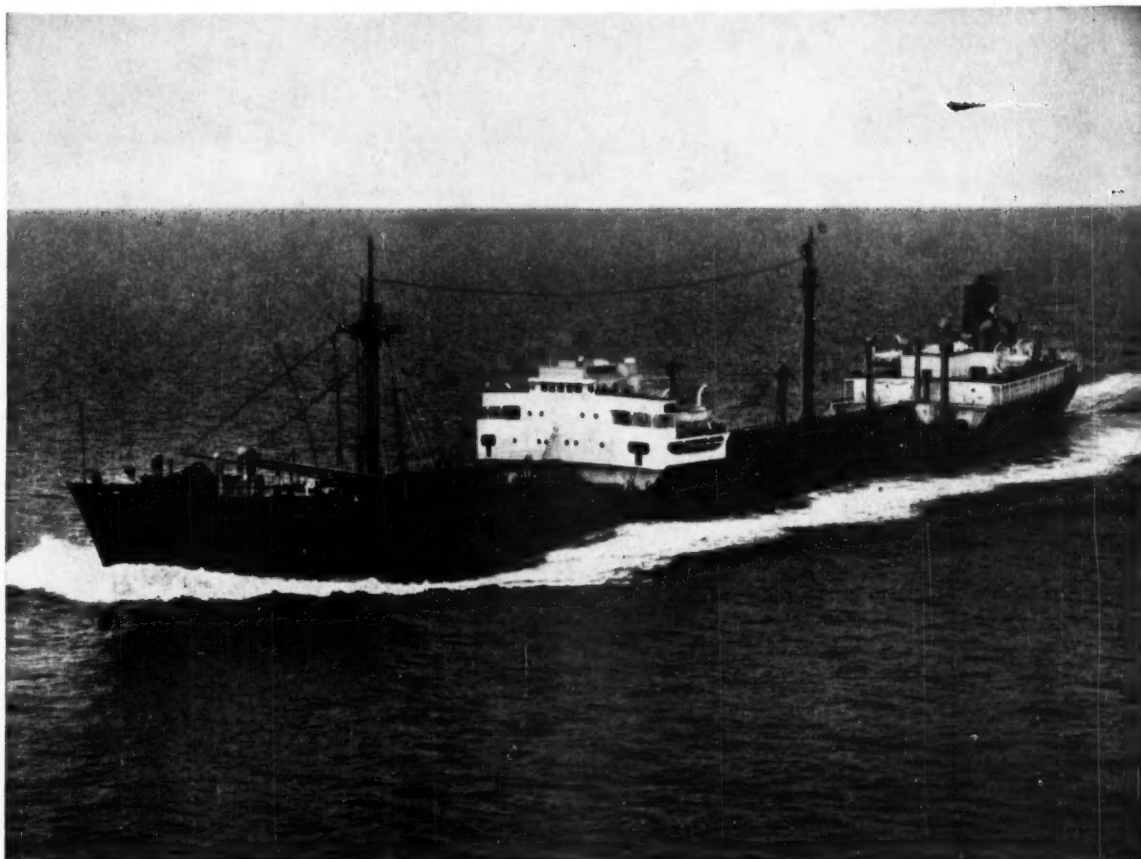
They are suggested as plasticizers, solvents, resin modifiers, shell-molding lubricants.—*General Aniline & Film Corp., New York 41, N. Y.*

**Polypropylene Glycols**

Compatible with oils and resins; surface active, noncorrosive, they're growing fast. (106G)

... Polypropylene glycols have numerous valuable properties. They're soluble in hydrocarbons, chlorinated solvents, alcohols, oils and resins. Their inverse water solubility makes them less soluble as temperature rises. Good viscosity-temperature relationships, high flash and low pour points, low volatilities and low hygroscopicities round out the physical properties. PPG'S show promise in lubricant applications because of their negligible corrosive effect on metals. And they're the least expensive synthetic lubricant available in quantity. Versatile solvent character-

istics dictate use of polypropylene glycols in ink and lacquer formulations. Polyglycol P1200 (Dow) is employed as an antifoam agent in paint, ceramics, paper and chemical process industries. Polyglycol P2000 (Dow) is used in preparation of petroleum demulsifiers. PPG's react with fatty acids to form nonionic surface active esters; with dibasic acids they yield alkyd resins. Some of the higher polymers are suitable for use in cosmetic formulations.—*Dow Chemical Co., Midland, Mich., and Carbide and Carbon Chemicals Co., New York 17, N. Y.*



*The S.S. Marine Dow-Chem on her delivery trials.*

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The first oceangoing tanker specifically designed and constructed for the transportation of liquid chemicals, the S.S. *Marine Dow-Chem* is another example of the many contributions Bethlehem has been making to shipbuilding progress for half a century.

Solving the complex problems posed in the waterborne movement of high-density chemicals, including synthetic organic compounds, inorganic acids and caustics, the *Marine Dow-Chem* can carry as many as 11 different products simultaneously with assurance

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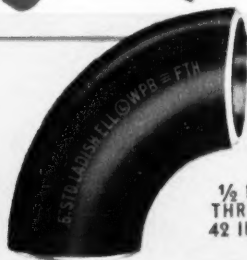
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**6 LARGE  
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AND RINGS**

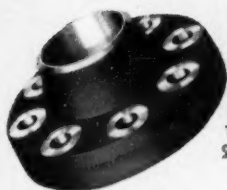
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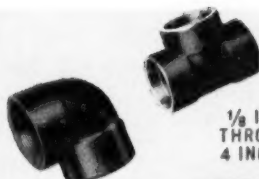
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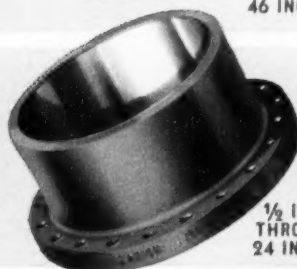
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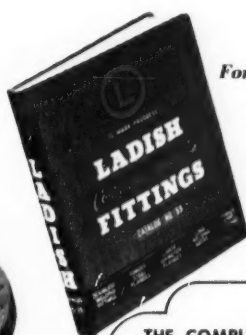
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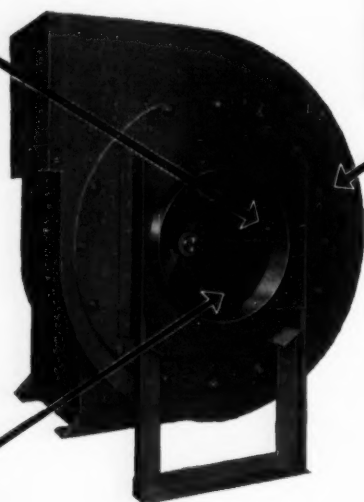
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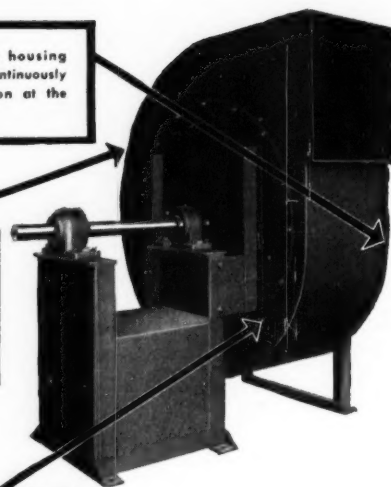


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Housing scientifically proportioned to minimize losses and maintain high fan efficiency.

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Good as chemical intermediates; for polymerization and solvent uses.

(111A)

**Saccharin**

New synthesis yields versatile intermediates.

(111B)

**Sequestrants**

Effective over wide pH range; high solubility.

(111C)

**Sodium Epoxystearate**

Source of epoxystearic acid.

(111D)

**Sodium lauryl sulfate**

Small needles.

(111E)

**Stabilizer for Organics**

Lead salt is used with halogen-containing organics.

(111F)

**Tall Oils**

Tall oil and components have abundant source and waiting market; uses include soaps, paints, drying oils, biologicals; cost—low and stable.

(111G)

... Three compounds from high-pressure acetylene reactions are available for use: 2-pyrrolidone and its N-methyl and N-vinyl derivatives. 2-pyrrolidone, available in tankcar quantities, is a valuable intermediate in reactions involving substitutions on the ring nitrogen. The ring can also be opened to form

... Saccharin synthesis from phthalic anhydride makes available many chemical intermediates in large quantities. Among those offered are: phthalimide, anthranilic acid, dithio dibenzoic acid. Phthalimide, an oldtimer, is a raw material for the synthesis of Apresolene (circulatory drug) and Primaquine (antimalarial). Anthranilic acid derivatives serve the dye, pigment, flavor, perfume fields. Dithio dibenzoic acid (formerly available only in limited quantities)

... Perma Kleers, stable salts of poly-amino carboxylic acids, are distinguished from ethylene diamine tetraacetic acid (EDTA) by their high solubility, superior chelation of ferric ion and greater efficiency for sequestering calcium and divalent metals over wide pH range.

... Sodium epoxystearate is available as a powder containing not less than 90% of sodium salt of 9, 10 epoxy-stearic acid. More stable than the acid, the salt is better able to prepare derivatives, has usual properties of fatty acid soaps, plus those of a very reactive oxirane structure such as occur with

... New form of sodium lauryl sulfate eliminates sneezing and sniffing often encountered in plants using powder

... Stayrite #229 is a lead compound that's effective in formulations subjected to high heat. Biggest use: heat stabilizer in both opaque and rigid polyvinyl chloride compositions. Compound can also stabilize chlorinated paraffins and act as curing agent for

... Tall oils—mixtures of fatty acids and rosin acids in combination with small amounts of unsaponifiable substances—have experienced rapid growth in just a few years: 283 million lb. in 1953 vs. 214 million lb. in 1948. Whole tall oil is lowest priced organic acid in the world—\$40 a ton in March, 1954. Price of refined oil has remained stable—about 5¢ per lb. over the last five years. In unsaponifiable fraction, beta sitosterol is of interest because of its use in synthesis of sex hormones and other biological compounds. Tall oils show to advantage in many products: Soap—Since saponification is effected

**... ORGANIC CHEMICALS**

$\alpha$ -aminobutyric acid. Methyl derivative, available in limited quantities is selective solvent for use in gas streams. Vinyl derivative, available in drum lots, polymerizes readily into water-soluble polymers having good complexing ability.—General Aniline Works Div., New York 14, N. Y.

finds use in making o-carboxy phenyl thioglycolic acid, an intermediate in thio-indigo manufacture. Dithio's derivatives can be produced, at reasonable prices, from saccharin process stream. One of them, thiosalicilic acid, finds use in pharmaceuticals, rubber, dye-stuffs. Saccharin, long hampered by old legislation, shows signs of broadening its markets, particularly in special dietary food and beverages.—Maumee Chemical Co., Toledo, Ohio.

Calcium is chelated down to pH 7. Ferric ion is sequestered well beyond pH 11 with little loss in efficiency. Added to soaps and detergents, Perma Kleers increase foam and detergency.—Refined Products Corp., Lyndhurst, N. J.

ethylene oxide. Epoxide group reacts with other chemicals having reactive hydrogen. Possible uses: grease additive, corrosion inhibitor for aqueous systems operating at low temperature on alkaline side and in detergent and cosmetic specialties.—W. E. Hardesty Co., Inc., New York 17, N. Y.

form. Its high bulk density means less storage space is required.—Aceto Chemical Co., Inc., Flushing 54, N. Y.

chlorosulfonated polythene. Stayrite's lead oxide content eliminates HCl released during heat degradation of PVC. #229 has high refractive index, 2.0, functions as screening agent for ultraviolet light.—Witco Chemical Co., New York 16, N. Y.

by merely mixing the oils with various bases, very simple equipment is required; Emulsions—Some soluble oil manufacturers favor tall oil soaps as emulsifiers because of their high oil solubility; Paint driers—Tallates (salts of tall oil acids) are replacing naphthenates and ethyl hexoates because of lower costs and greater solubility; Drying oils—limed tall oils act as gloss oils in interior paints; Modified alkyd resins—Tall oils are used as modifiers to control cross linkage and impart solubility, gloss and flexibility. Resins cost less than straight oil modified alkyds.—Tall Oil Assn., New York 17, N. Y.



## ORGANIC CHEMICALS . . .

**Thiophenol**

In semi-commercial quantities. (112A)

. . . Thiophenol,  $C_4H_4S$ , available in semi-commercial quantities, should attract makers of pharmaceuticals, polysulfone resins (stabilization), dyes, bu-

tadiene interpolymers (millability), polymerization regulators and oil additives.—*Evans Chemetics, New York 17, N. Y.*

**Trifluoroacetic Anhydride**

Aid to making esters, nitrates, ketones, sulfones. (112B)

. . . Trifluoroacetic anhydride, made by dehydrating trifluoroacetic acid with stabilized sulfur trioxide, should be important in a variety of reactions. Biggest use: in direct production—without other catalyst or promoters—of monomeric esters which normally polymerize in presence of strong acids.

Phosphate and nitrate esters can be made directly from their respective acids with the anhydride. Production of ketones by direct reaction of carboxylic acid with phenyl esters is feasible. Product requires glass or metal equipment.—*Minnesota Mining & Mfg. Co., St. Paul 6, Minn.*

**Vinylpyridine**

Its polymers may find uses in rubber bonding formulations. (112C)

. . . Polymers of 4-Vinylpyridine are higher melting and less soluble in organic solvents than those of 2-Vinylpyridine. 4-Vinylpyridine reacts with sulfurous acid to give pyridylethane sul-

fonic acid, with nitrous acid to give nitroethyl pyridine and with alcohols and amines to give pyridylethyl ether and amines, respectively.—*Reilly Tar & Chemical Co., Indianapolis 4, Ind.*

## • Protective Coatings

**Absorbers, Ultraviolet**

Act as protective coatings, stabilizers. (112D)

. . . Uvinul 400 and Uvinul 490 protect materials from deterioration caused by ultraviolet radiation. They work in transparent films to shield surfaces and also act as stabilizers for materials subject to degradation. Uses as protec-

tive agents, in lacquers, plasticized cellulose acetate, coatings, waxes, creams. Uses as stabilizers: plastic sheets; polymethylmethacrylate, polyester resins.—*Antara Chemicals, New York 14, N. Y.*

**Aluminizer**

Makes it possible to metallize surfaces without heat. (112E)

. . . Kometal, a mixture of finely pulverized aluminum in a plastic base, can be used to aluminize surfaces by air hardening. Coating forms a plastic bonded aluminum surface that can be polished, ground, rolled, or bent to 45 deg. without chipping or cracking,

and retains finish and firm adhesion over wide temperature range. Product is recommended as coating for interior of all types of tanks, proves an excellent exterior coating for acid cooling coils.—*Enjay Maintenance Engineers, Rutherford, N. J.*

**Aluminum Paint**

Stays in suspension longer than standard aluminum paste. (112F)

. . . An aluminum paint, MD-515, has high pigment volume and retains itself in suspension longer than standard aluminum paste. Controlled particle size

distribution gives superior covering capacity coupled with coarser mesh size.—*Metals Disintegrating Co., Elizabeth, N. J.*

**Aluminum Pastes**

Non-leaking, for protective coatings. (112G)

. . . Two aluminum pastes, MD 584 and MD 784, are for use in protective coatings. Pigments carry grease film of such nature that flake will not leaf or

flow when formulated in paint. This makes possible uniform dispersion of pigment.—*Metal Disintegrating Co., Inc., Elizabeth, N. J.*

**Antirust Paint**

One application lasts up to ten years. (112H)

. . . A one-coat, antirust paint for steel, Adelphi One Coat Counter-Rust, can be applied over any paint that's in fair-to-good condition. Equal to three coats of conventional rust inhibitive

paint, Counter-Rust is expected to protect steel 5-10 years. Solvents which evaporate to form pinholes have been eliminated.—*Adelphi Paint & Color Works, Inc., Ozone Park 17, N. Y.*

**Coating for Polystyrene**

Scratch resistant. (112I)

. . . BE-40 has high adhesion, high gloss and resistance to physical abuse. Curing: 15-min. air-drying followed by an

hour at 150 F. in an oven or under infrared lights.—*Schwartz Chemical Co., New York, N. Y.*

**Coatings for Plastics**

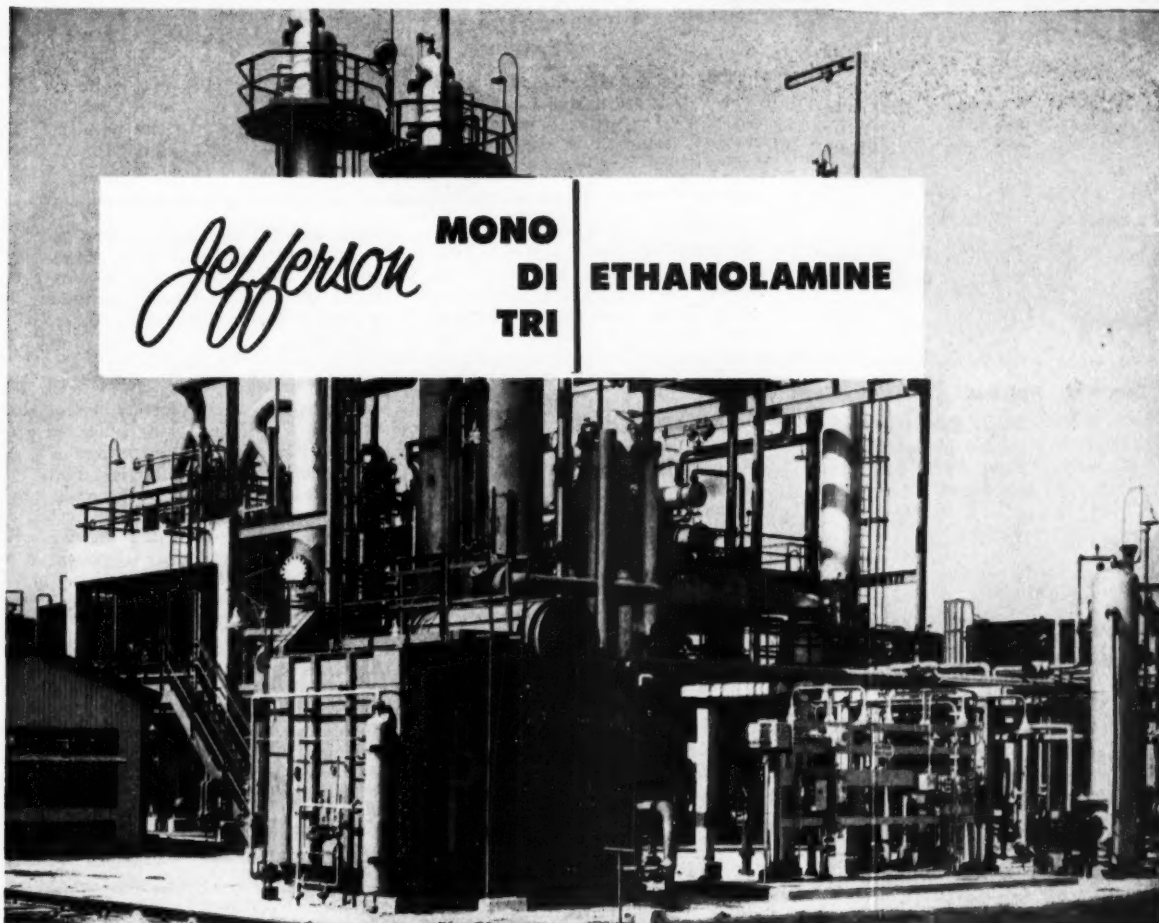
Can be pigmented or dyed. (112J)

. . . Three basic coatings for plastic materials can all be pigmented or dyed. One series is for styrene, Royalite, acrylic and certain kinds of acetate; sec-

ond is for molded polystyrene; third can be used in metallizing phase of plastic decorating.—*Sullivan Chemicals Div., Chicago 22, Ill.*



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  - Rubber
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Ethylene Oxide  
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Diethanolamine  
Triethanolamine  
Nonyl Phenol  
Morpholine  
Ethylene Carbonate  
Propylene Carbonate  
Polyethylene Glycols  
Glycol Ethers

PROTECTIVE COATINGS . . .

**Drying Oil**

Competes with dehydrated castor, tung, linseed oils. (114A)

. . . Conjugated drying oil, Safflower 22, dries to gloss film twice as fast as un-bodied oil. Polymerizes twice as fast as catalyzed linseed oil at same bodying temperatures, alcoholizes faster than

soy or linseed oil. It's easily oxidized, exhibits wrinkling characteristics similar to tung or dehydrated castor oil.—Pacific Vegetable Corp., Los Angeles 23, Calif.

**Enamel**

Heat resistant, lower cost. (114B)

. . . Hi-Heat Enamel, wedding of silicone and alkyd resins, retains up to 75% of heat resistant qualities of silicone without loss in durability. Enamel is non-yellowing under sustained temperatures over 500 F. Potential applica-

tions: wall and space heaters, deep fry units, roasters, industrial parts. Costs less than all-silicone enamels, conventional silicone-alkyd blends, porcelain enamels.—Sherwin-Williams Co., Cleveland, Ohio.

**Enamel, Baking**

First successful water soluble phenol-formaldehyde resin for metal coatings. (114C)

. . . Hydrophen resin is a protective coating that uses water—rather than costly, flammable organics—as solvent. Secret of its success is use of three-component system. A phenol alcohol (for hardness and abrasion resistance) is mixed with an alkyd resin. Then ammonia or a substituted amine is added. Resulting product has abrasion resist-

ance, flexibility, water solubility. In use Hydrophen is thinned with tap water and then applied to metal surfaces as either clear or pigmented finishes. Finished coating is water impermeable, weather-proof, corrosion resistant and flexible enough to allow deep pressing and stamping.—Reichhold Chemicals, Inc., Detroit, Mich.

**Enamel, Baking**

World's first water-emulsified baking enamel for fabricated metals. (114D)

. . . A water-reducible, nonflammable, high gloss industrial enamel for metals is made from alkyds and ureaformaldehyde resins which are emulsifiable so that water can be added as a thinner at the point of application. No expensive solvents or solvent recovery systems are needed. The coating, Industrial Emulsion Enamel Black is geared for

many uses in metal-working industries. Its hardness and adhesion are equal to or better than existing materials, it machines easily and won't vapor wash. In addition, the final, baked-on film is resistant to oil, water, soil and alkali and is definitely not flame-supporting.—Sherwin-Williams Co., Cleveland, Ohio.

**Enamel, Flexible**

For metal surfaces requiring extreme durability, alkali and abrasion resistance. (114E)

. . . High hardness silicone finish, Nubleon-S is hard enough to use on home appliances and prefabricated buildings yet flexible enough to be applied before metal is formed. Only one coat is needed and unlike other baking enamels, product is very flexible, more

flexible even than a typical alkyd amine coating over an epoxy resin base primer. Nubleon-S is stain resistant to dyes, hot coffee and corrosion resistant to crude tall oil, carbon tetrachloride, formaldehyde and 2-ethyl hexoic acid.—Glidden Co., Chicago 39, Ill.

**Enamel, Safety**

Permanent suspension of abrasive in resin defies heavy traffic. (114F)

. . . New skidproof enamel, Convoy, is mixture of silicon carbide and plastic resins floating in a magnetic field. Permanent suspension of silicon particles gives extra tooth to enamel. Stands

up well under heavy loads. Resistant to mild acids, salt spray, H<sub>2</sub>O, sulfur, oils, greases and temperatures of -40 to 180 F.—Kelley-Mahorney Co., Louisville, Ky.

**Epoxy Resin**

Gives chemical and abrasive resistance. (114G)

. . . Epoxy resin content of Erkopon protective coating for tank lining gives superior chemical and abrasive resistance, tenacious adhesion, exceptional

flexibility in finished film. It's available in air-dry and baking types for brush or spray application.—Earl Paint Corp., Utica 2, N. Y.

**Flatting Agent**

Needs no grinding before addition to varnish formulations. (114H)

. . . Santocel 54 flatting agent requires little or no grinding before it's added to varnish or lacquer preparations. Simple stirring often achieves good mixing. Result: better formulations where exces-

sive grinding lowers flatting efficiency. Santocel 54 enables formulators to achieve hand rubbed quality in finished products.—Monsanto Chemical Co., St. Louis 4, Mo.

**Galvanizer**

For cold galvanizing steel and iron surfaces at lower cost. (114I)

. . . Despite considerably lower cost, Galvicon, a cold galvanizer, equals and, in many cases, out-performs other surface protection techniques for iron and steel, including electroplating, hot-dipping, cementation, painting. Prod-

uct differs from so-called metallic paints containing zinc in that it combines with the base metal, setting up electrical continuity and offering true cathodic protection.—Galvicon Corp., New York 1, N. Y.

### Laminate, Metal-Plastic

Combines structural strength of metal with corrosion resistance of vinyl plastic. (115A)

... Method of laminating vinyl plastic and sheet steel or aluminum makes metals decorative, yet permanently corrosion-proof. Resulting laminate, Marvinol-Metal Laminate, has higher abrasion resistance than varnish, paint or baked enamel finishes, is strong enough to allow 180 deg. bends and deep draws with no separation. Some products envisioned: cheap, corrosion-resistant containers for chemicals, chemical piping and ducts, machine housing.—Naugatuck Chemical Div., U. S. Rubber Co., New York 20, N. Y.



### Laminate, Paper Base

Eliminates fire hazards in electrical equipment. (115B)

... Paper base laminate, G-E 11537, for switchgear, control equipment and other heavy electrical equipment where fire hazards exist and mechanical and insulating properties are needed. Burns only at elevated temperatures, is self-

extinguishing in one minute or less. Good cold flow characteristics, low moisture absorption. Retains excellent electrical properties at temperatures up to 125 C.—General Electric, Pittsfield, Mass.

### Metallic

First pigmented type not to gel on standing; for thermosetting plastics. (115C)

... Pigmented metallic coating for phenolic, polyester, urea and melamine plastics is Logoquant P-6. Finish is first of its kind not to gel on standing. At 100 F. and 100% relative humidity, coating shows no softening or loss of

adhesion after 800 hr. Best results are obtained with 10 minute bake at 250 F., but quality sufficient for most needs can be achieved by air drying Logoquant coating below 250 F.—Logo, Inc., Chicago 33, Ill.

### Odorless Paint Aid

Renders alkyd resins compatible with odorless paint solvents. (115D)

... Use of special grade of glyceryl monooleate (S1096R) solves problem of formulating odorless oil base paints so that sufficient solubility of alkyd resins in odorless solvents is obtained without loss in covering power and danger of instability. Odorless solvents with glyceryl monooleate keep alkyds in

solution within reasonable viscosities and with freedom from stability worries. Amount varies from 5 to 15% by weight on vehicle solids. Costs need not be increased because GMO replaces an equal amount of alkyd resin, however.—Glyco Products Co., Inc., Brooklyn 1, N. Y.

### Paint Chemicals

One is water resistant emulsion; the other is freeze-thaw stable latex. (115E)

... Two products for protective coating industry are Polyco 556, a butadiene-styrene latex, and Polyco 522, a polyvinyl acetate emulsion. As vehicle for primers and topcoats, Polyco 522 resists freeze-thaw cycles, develops films of high water resistance. Paints made

with 522 adhere to plaster, concrete and stucco. Polyco 556, the latex, finds wide use as a pigment binder. It's compatible with other resinous materials (alkyds) and exhibits freeze-thaw stability.—Borden Co., Chemical Div. New York 17, N. Y.

### Paints, Jelly

Paint vehicles give gelled consistency; prevent settling. (115F)

... Oil base paints, containing new thixotropic alkyds, are thick, jelly-like and non-flowing. They need never be stirred, are ready for use at any time. Paints stored more than two years showed no settling, had their original

consistency, were ready to use without stirring or thinning. Color uniformity was unimpaired. Friction of brush contact causes paint to thin and flow smoothly while being applied.—T. F. Washburn Co., Chicago, Ill.

### Paints, Titanium

Butyl titanates. (115G)

... Butyl titanate-based paints have special qualities other than heat resistance. Pigmentation with zinc yields

a corrosion resistant polymer, especially for marine use.—Australian Defense Standards Labs, Melbourne, Australia.

### Plastic Finish

For acrylics. (115H)

... Improved finish for acrylic plastics, Logoquant SF252, is available in pigmented colors and metallics, unpig-

mented gold and aluminum metallics. It's entirely grease resistant.—Logo, Inc., Chicago 33, Ill.

### Resin-base

Resistant to strong oxidizing acids. (115I)

... Nerva-Kote Fluorinox, a fluorinated resin-base coating, has extreme resistance to severe oxidizing agents such as fuming, concentrated or dilute nitric, sulfuric, hydrofluoric and hydrochloric

acids. It's an air-drying material and doesn't have to be fused or baked on.—Nerva-Kote Div., Rubber & Plastic Compound Co., Inc., New York 20, N. Y.

PROTECTIVE COATINGS . . .

**Resin Emulsion**

Bonds to damp surfaces; resistant to oils, acids, alkalis, mildew. (116A)

. . . Dampness creates capillary attraction between Braemul—thermoplastic, plasticized bituminous resin emulsion—and surfaces to be protected. Resistant to oils, greases, aliphatic solvents, acids, alkalis, fungus and minerals found in earth. Valuable for use in underground

protection. Stable from -50 to 210 F. Will not run, flow or sag at dry temperatures up to 210 F., but will soften when continually submerged in liquids at temperatures over 100 F. It's non-toxic, nonfuming, nonflammable. — Service Industries, Philadelphia 34, Pa.

**Rubber, Flame Retardant**

Silicone elastomer withstands 600 F. temperatures. (116B)

. . . SE-101, flame retardant silicone rubber, is used as coating for glass cloth used as coupling material for heater ducts in Vultee's Model 340 Convair-Liner. Material withstands heat to 600 deg. F., has excellent crease and abrasion resistance and unusual flame retardancy. SE-101 can be ignited only

with difficulty by an external flame. It has slightly lower dielectric than the 1,400 volts per mil attributed to its parent material, SE-100, but has same stability of electrical properties over entire temperature range of -76 to 600 F.—General Electric Co., Pittsfield, Mass.

**Rust Preventive**

Protects iron, steel in 100% humidity. (116C)

. . . Compound NR-31, a mildly alkaline, water-soluble material, is a rust preventive for steel, cast iron and iron alloys in storage, protects against

100% humidity for several weeks. Leaves almost no visible film on steel, is easily washed off. — Enthone, Inc., New Haven 11, Conn.

**Silicone**

For flexibility and adhesion after long aging at high temperatures. (116D)

. . . Two new silicone resins for protective coatings: Dow Corning 805 and 807. Resin 805 retains flexibility and adhesion after long aging at elevated temperatures. Outstanding resistance from 600 to 1,000 F. Resin 807, air-drying, modified silicone-alkyd resin,

is used in exterior finishes. Clear or pigmented coatings have good weather and chalking resistance, color retention. Can be combined with nitrocellulose for greater flexibility, adhesion, cold-check resistance.—Dow Corning Corp., Midland, Mich.

**Strippable**

Protects metals during drawing. (116E)

. . . Tough strippable coating, supplied as solvent solution, is water insoluble and extremely strong even in thin gages. CD Strip 100 protects alumi-

num and other metals during drawing and shields glass, phenolic laminates.—Chemical Development Corp., Danvers, Mass.

**Strippable**

No oil exudation up to 160 F. (116F)

. . . Cellulose acetate butyrate is base plastic for hot-melt, strippable coating for metals called Dip-Pak #661. Product is unique in that it does not bleed oil even at temperatures of 160 F. and is flexible from -50 to 160 F. A tough, rubbery, thermoplastic com-

pound, Dip-Pak #661 functions as a semi-permanent coating for metal objects, strippable coating for metal, insulating and potting compound for objects kept below 160 F., plating stop-off.—Fidelity Chemical Products Corp., Newark, N. J.

**Thermal Insulator**

Stands up under 5,000 F. flame. (116G)

. . . Pyrolock, insulating material, protects metals at temperatures above their melting points. It can be sprayed like paint on clean metal surfaces without

sandblasting or priming. Modified version protects surfaces against water, acid, weather.—B. F. Goodrich Co., Akron, Ohio.

**Vinyls**

Protect equipment from abrasion and corrosion. (116H)

. . . Two polyvinyl chloride-based protective finishes, vinyl resin-pigment-solvent and vinyl plastisol, can shield metal, wood, concrete. Flexible, fast drying and adhesive, Magic-Vulc vinyl coatings also serve as electric insulators,

material for molding and casting films and sheets and glass yarn. Since the plastisol contains no solvent its coatings do not shrink when converted to a solid film.—Magic Chemical Co., Brockton 2, Mass.

**Water Proofer, Masonry**

Keeps limestone from cracking under severe weathering. (116I)

. . . Masonry walls can be effectively waterproofed with sodium methyl silicate (SC-50). Studies of four types of limestone showed, after SC-50 treatment, little moisture absorption. All four types were quite resistant to ferric chloride staining. Water soaked stones coated with the silicate and put through a severe freezing-thawing test,

which was repeated 10 times, showed practically no damage. More tests are needed to determine the resin's durability, however, since at the test's end coated stones absorbed moisture more readily, indicating resin film was slowly breaking down.—General Electric Co., Silicone Products Dept., Waterford, N. Y.



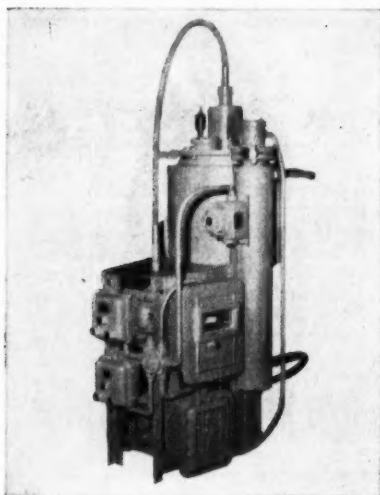


FIGURE 11  
One type of pilot plant dispersion unit.



Pouring cool sample of sodium dispersed in high flash point medium illustrates ease of handling. Samples are available for initial investigations.

## HOW TO MAKE SODIUM DISPERSIONS

With the development of sodium dispersions, the value of metallic sodium as a reaction tool on a commercial scale has been multiplied many times over. While sodium bricks and molten sodium have been used for years in the manufacture of materials

such as sodium methylate and fatty alcohols, the high reactivity and ease of control inherent in dispersions permits a vast broadening of practical sodium applications.

To test the laboratory or pilot plant value of sodium dispersions in your process is a simple matter requiring little or no investment in equipment. For example, Figure I shows a simple laboratory unit consisting of a creased flask, a special high-speed stirrer, nitrogen purge lines, reflux condenser and addition funnel. Fifteen minutes mixing at 105° C. is generally sufficient to produce good dispersions containing 50% sodium with particles averaging 10 to 20 microns. Subsequent reactions may be carried out in the same equipment, giving high yields under easily controlled conditions.

Figure II shows a 15 gallon pilot plant dispersion unit which handles 20 to 50 pounds of sodium. Modified versions for handling smaller quantities are easily fabricated. The method of preparation and mixing time is quite similar to the laboratory equipment, and the charge consists of brick sodium or molten sodium from a melt tank. Units up to 500 gallon capacity have been put into operation.

Our technical service people

will be glad to work with you on modifications of equipment already available in your laboratory or pilot plant, and will supply complete information on dispersion preparation and use. In addition, we offer a booklet, "Sodium Dispersions", which tells you how to make and use these dispersions in many reactions, such as:

- Claisen Condensations.
- Wurtz type reactions.
- Preparation of sodium alcoholates.
- Purifications.
- Preparation of organo-sodium compounds.
- Metalations.
- Replacement of active hydrogen by sodium.
- Polymerizations.

Metallic sodium is manufactured by National Distillers Chemical Co., at Ashtabula, Ohio, and sold by U. S. Industrial Chemicals Co. (both divisions of National Distillers Products Corp.) 99 Park Avenue, New York 16, N. Y. Branches in all principal cities.

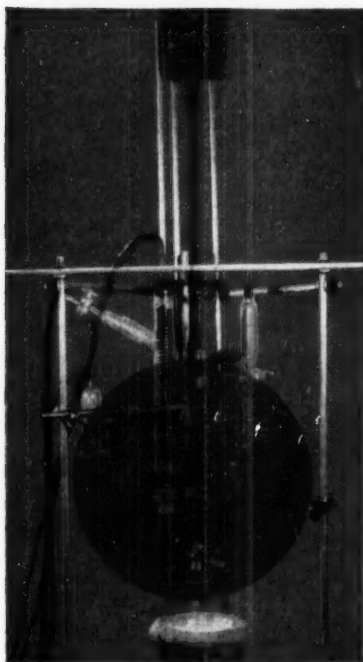


FIGURE I  
One type of laboratory dispersion unit.

Please send me your booklet, "SODIUM DISPERSIONS". I am interested in sodium for

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

U. S. INDUSTRIAL CHEMICALS CO.

## • Pulp and Paper Chemicals

### Acids from Redwood

Low cost, weak organic acids from tree bark. (118A)

... New redwood bark extracts are palcotanic acid, palconic acid and the sodium salt of each (Palcotan and Palconate). All four compounds are inexpensive, lower in carbohydrate content and far more active than organics recovered from conventional pulping liquors. Palcotan, in particular, is soluble over entire pH range. Applications include use as dispersing agents in gypsum board, linoleum paste and carbon black; binders and deflocculants in

ceramic clays; anti-oxidants and sequestering agents in boiler feed water; partial phenol replacement in plywood adhesives; flotation agents in ore beneficiation. Palconate has also been used as a stabilizer in asphalt emulsions and shows promise in its ability to form insoluble salts with many metals. To date, however, the largest sales have gone to the oil fields to replace quebracho in drilling muds. — *Pacific Lumber Co., San Francisco, Calif.*

### Bioicide

Kills slime-causing bacteria in paper mills. (118B)

... Crag 974, 3,5 dimethyltetrahydro-1, 3, 5, 2 H-thiadiazine-2-thione, a commercial biocide for killing slime-causing bacteria in paper mills, is as economical as chlorinated phenols and

mercurials. Large initial dose is normally used. Concentration is then reduced until best control level is reached.—*Carbide & Carbon Chemicals Co., New York 17, N. Y.*

### Calcium Lignosulfonate

Sugar-free forms should have many important uses. (118C)

... Two types of desugared calcium lignosulfonate—a viscous, coffee-colored solution and a free-flowing, light tan powder—are available. Toranil A and B are water soluble, yet virtually nonhygroscopic. Since nearly all sulfur dioxide and sugar are removed in Tora-

nil manufacture, A and B should find increased applications. Present uses include: dispersing agents for fertilizers and oil well drilling muds, adhesives, resin extenders, foam stabilizers and emulsifiers.—*Lake States Yeast Corp., Rhinelander, Wis.*

### Germicide

Product and process for imparting germ-killing properties to paper. (118D)

... Tests show that Permachem, a germicidal process and product, is effective on materials for their useful life with no apparent physical change. It operates against many disease-producing germs, fungi and mildew producing organisms. Process binds active agent, like silver, in highly ionized form to material. Because only min-

ute quantities of Permachem are required, price of finished item is not markedly increased. Applications: pulp and variety of finished paper. Paper treatment is possibly the simplest to accomplish because it can be done during several of the wet stages of production.—*Permachem Corp., New York 17, N. Y.*

### Mildew Preventive

For paper mill felts; eliminates need for bactericides. (118E)

... Dewpruf, effective treatment against bacterial damage, improves felt operations in paper industry. It is permanent treatment that resists leaching, does not reduce wet tensile strength of

woolen felt and can be used throughout pH range in which bacteria are active. Other uses: in phosphate containing systems.—*F. C. Huyck & Sons, Rensselaer, N. Y.*

### Size, Resin

Paste-fortified. (118F)

... Pexol 240 is made from dark rosin and provides a highly efficient size at low cost. A reduction of up to 50%

is possible in amount of size needed over dark grade.—*Hercules Powder Co., Wilmington, Del.*

### Size

Improves foam conditions in paper mills. (118G)

... First low-foaming synthetic engine size for paper is an addition to manufacturer's Mersize family of synthetic sizes. "Foam index" of this size has been substantially lowered without

sacrificing high size efficiency. Many mills are now able to eliminate defoamants from their processes without price increase.—*Monsanto Chemical Co., Everett, Mass.*

### Starch Derivatives

For calender sizing and head-box additive in paper mills. (118H)

... Cato Starch is a cationic derivative developed for wet end addition on paper machines. It improves mullen, fold, tensile and pick strengths at low concentrations on different pulp types. Cato also improves sheet formation and drainage on paper machine wire. The other products are all carboxymethyl starches, called CM. The hydrophilic and excellent film-forming properties

of CM starches retard penetration of ink, grease and wax. Some uses: calendering applications for improving the gloss ink printability of patent-coated boxboard; in barrier film on porous board; tub, sizing; beater additive. CM starches range from white to light in color and come in high, medium and low viscosities.—*National Starch Products, New York 16, N. Y.*

# New products from Wyandotte



## HALANE

—an unusually stable chlorine-liberating compound

Halane (Dichlorodimethylhydantoin) provides exceptional control of the bleaching process when formulated into a bleach, due to its uniform rate of chlorine liberation . . . uses available chlorine (66% min. by wgt.) more effectively. Other suggested uses: chemical intermediate, germicidal rinse compositions, odor removal from organic products, rubber and plastic treating and formulating, sterilizer, wool shrinkproofing, wool stripping. Unusually stable and essentially free from explosion hazard even when contaminated.

## PLURONICS\*

—100%-active nonionic surfactants

Wyandotte's new Pluronics provide an over-all balance of desirable properties, plus unique flexibility. Any given molecular weight or hydrophobic-hydrophilic ratio can be attained.

### Pluronics L61, L62, L64 and L44 (liquids)

—Stable to acids, alkalis and metal ions. Cotton and hard surface detergency is excellent, particularly for L64 and L44. Cotton wetting is fair; hard-surface wetting is outstanding. In use, all are essentially nonfoaming. Users of these Pluronics are getting remarkable results in: low-foaming laundry detergents, insecticide emulsification and dust-laying, pulp additives, metal cleaning, metal cutting, petroleum demulsifying, textile processing.

**Pluronic F68 (flake or powder)** —the only 100%-active nonionic surfactant commercially available in flake form. It is nonhygroscopic, has unusually low toxicity, and is practically tasteless. Stable to acids, alkalis and metal salts. It has no cloud point in distilled water, is low foaming and an exceptional dispersant. Dye leveling, water

treating, pharmaceuticals, shampoos, metal cleaning adhesives, and dispersion of paint pigments are some present fields of use for Pluronic F68.

## GLYCOLS (Ethylene and Diethylene)

—high-purity petro chemicals

Every day, new uses are found for these purer grades of industrial glycols. They are already used in the processing and manufacture of cellophane, synthetic fibers, synthetic rubber, explosives, paper, adhesives, resins and dyes. One new synthetic rubber, for instance, made with ethylene and diethylene glycol, gives tire treads five times the wear resistance of cold rubber. Resistance to oxidation is claimed to surpass both natural and other synthetics.

\*REG. U.S. PAT. OFF.

For further information on these and other new Wyandotte products, call your local Wyandotte representative, or write us direct. If you are able to give details of your expected applications, we will gladly supply the proper samples and pertinent information for your evaluation . . . May we serve you? *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*



# Wyandotte CHEMICALS

## HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine  
Calcium Carbonate • Calcium Chloride • Glycols • Chlorinated  
Solvents • Synthetic Detergents • Agricultural Insecticides  
Other Organic and Inorganic Chemicals

## • Resins and Plastics

### Acrylates

Film-forming. (120A)

... Methoxy and butoxyethyl acrylates are available in pilot plant lots. When cured, butadiene copolymers form hard,

tough, glossy, non-tacky, insoluble and infusible adhesive films.—Rohm & Haas Co., Philadelphia 5, Pa.

### Alkyd Coating Resin

Lowers cost of enamels and lacquers with no quality sacrifice. (120B)

... Alkyd coating resin, Duraplex ND-79, has same properties as manufacturer's standard nonoxidizing alkyd, Duraplex ND-78, but its price is 1¢ per lb. lower—26.5¢. ND-79 is resin with good color and color retention,

high gloss and good resistance to alkalis. It can be combined with urea, melamine and triazine resins to give tough enamel finishes. Common solvents can reduce the resin.—Rohm & Haas Co., Philadelphia 5, Pa.

### Antiglare Plastic

Cuts air-conditioning and fuel bills; protects against solar heat, glare, ultraviolet rays. (120C)

... Thermoglare, a thermoplastic available in both sheet and spray-on film forms, effectively controls glare and solar heat in industrial plants. It filters out up to 95% of ultraviolet rays and 80% of infrared transmission. The coating, Thermoglare Film, is weather

resistant and remains effective for 3 years. The sheet, Thermoglare Sheet, is shatterproof and is designed to be used instead of glass window panes. Both forms are highly translucent.—Eastern Industrial Service, Inc., Cambridge 40, Mass.

### Cleaner for Styrene

Used prior to metallizing, leaves no residue when air-dried. (120D)

... Latest use for an established liquid cleaner, Poly-Kleen, is in preparing polystyrene surfaces to secure maximum adhesion of lacquer coat used prior to metallizing. A solvent type liquid, it

quickly removes grease, oil stains, mold lubricants from styrene without marring or crazing even the thinnest polystyrene stock.—Schwartz Chemical Co., New York, N. Y.

### Epoxy Resins

Consumption surges as they bid for application as structural materials as well as protective coatings. (120E)

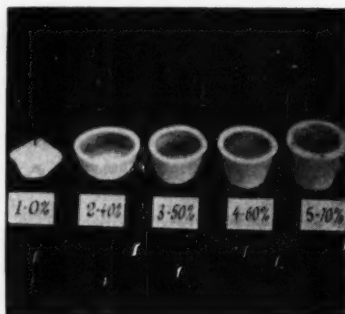
... Epoxy resins consumption spurted from half a million pounds in 1947 to 7 million in 1952 and producers are readying a thirty million pound capacity to meet even bigger demands. The brightest chemical processing potential is in primary structures like tanks and pipelines. Glass fiber reinforced epoxies provide an ideal combination of high leak resistance at high pressures and superior shear properties with excellent resistance to most corrosive chemicals. Already being developed are glass fiber reinforced epoxy pipes for transporting sour crude oil

and salt water at pressures of 1000 psi. and temperatures of 100-200 F. Can and drum lining, industrial maintenance paint, appliance primers are best outlets in protective coatings field but big uses are anticipated in wire enamels and tin decorating (in the primer coat, lithographing inks and clear, outer coating). Epoxies have unique adhesive properties: some varieties retain 85-90% strength at 500 F.; curing is possible at low temperatures with no volatile release.—Shell Chemical Co., New York 20, N. Y., Bakelite Co., New York 17, N. Y.

### Ethylene Polymer

Enhances mechanical properties of polyethylene. (120F)

... Marlex 20, unique ethylene polymer with predominant polymethylene structure, is resistant to concentrated acid attack at room temperature. It's also virtually unaffected by common organic solvents at room temperature, but is swollen by chlorinated, aliphatic and aromatic hydrocarbons. Biggest use: in blends with flexible polyethylene, where it raises softening point, heat distortion temperature, melt index, hardness and tensile strength. Marlex 20 blends with waxes to give similar advantages.—Phillips Petroleum Co., Bartlesville, Okla.



### Film Base, Synthetic

Greater strength and stability than present types. (120G)

... Polyethylene terephthalate, related to Dacron and Mylar polyester insulating film, gives greater strength and dimensional stability to motion picture film. Also reduces film thickness needed, making possible greater footage per reel. Advantages over cellu-

lose nitrate or acetate films: 2X tensile and tear strengths; 4X elongation. Film not affected by humidity changes or complete water immersion. Reduction in film thickness cuts shipping, storage costs.—E. I. du Pont de Nemours & Co., Wilmington, Del.



**Foam, Flexible**

Breathes; is self-extinguishing. (121A)

... Process using vinyl plastisols based on Bakelite's vinyl resins produces soft, flexible, cured foam that's easily fabricated at price comparable to foam rubber. Foam breathes because gas mixed with plastisol provides uniformly dis-

tributed interconnecting cells. Abrasion and corrosion resistance are excellent. Foam plastisol only scorches under flame, is self-extinguishing after it's removed.—*Elastomer Chemical Corp., Newark, N. J.*

**Foamed Silicone Resins**

For lightweight, non-flammable structure; withstand temperatures above 700 F. for 20 hr. (121B)

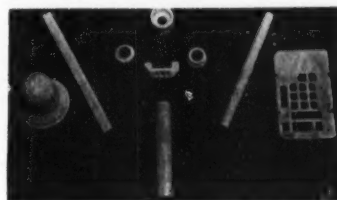
... Two silicone resins, XR-543 and XR-544, can be blown and expanded to form uniform, closed cell structures weighing as little as 8 lb. per cu. ft. XR-543 has good compressive strength at low temperatures, becomes thermoplastic above 500 F. without change in appearance. It's suggested for use in

vibration damping, electrical, acoustical and thermal insulation. XR-544 doesn't lose compressive strength, can be used wherever both high strength at elevated temperatures and good heat stability are needed such as in fire walls.—*Dow Corning Corp., Midland, Mich.*

**High-Impact Resin**

Thermoplastic performs well over wide temperature range. (121C)

... Cyclocac, a thermoplastic, styrene-type resin, is hard, light and tough, easily worked and can be sprayed in colors on elastic rubber surfaces. Uses: piping (withstands 200 psi., is lighter than iron and steel), molded fittings, automotive equipment, chemical process equipment.—*Marbon Corp., Gary, Ind.*

**Insulation Resin**

Epoxy resin usable from 3-5 days before setting up. (121D)

... Scotchcast No. 3, with a utility life of from 3 to 5 days before setting up, promises to be of value to electrical manufacturers who need an insulation resin that can be mixed in large quantities for use over a period of days. Other advantages of Scotchcast are its good electrical and physical

properties and short cure life—2 to 4 hours at 250 F. Low viscosity and freedom from volatiles make it preferable to conventional varnish-impregnated paper and cloth insulation for impregnation of coils where increased moisture resistance is desired.—*Minnesota Mining and Mfg. Co., St. Paul 6, Minn.*

**Melamine Resin**

Gives paper 2X dry, 5X wet strength of untreated paper. (121E)

... Melostrength, melamine resin, added to paper pulp to yield strong paper, imparts a high degree of resistance to acid hydrolysis. Treated papers retain almost all their strength even

when subjected to acids found in fruits, vegetables, meats. Major current uses are non-industrial: freezer packages, blueprint papers and army maps.—*American Cyanamid Co., New York 20, N. Y.*

**Metal Repair Compound**

Al-epoxy resin is hard, machinable. (121F)

... Metalset A-101 can be used for repairing castings, filling joints in sheet metal and building up surfaces of patterns, molds and dies. An aluminum-

containing epoxy resin, product hardens by polymerization with negligible shrinkage, will not crack.—*Smooth-On Mfg. Co., Jersey City, N. J.*

## Your Inventory of New Chemicals and Materials

### What It Contains . . .

This inventory digests some 252 of the most important new, improved or newsworthy chemical products developed or commercialized during the second six months of 1953 and the first six months of 1954. It includes only those products of major signifi-

cance or prime interest to chemical engineers in the chemical process industries.

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## RESINS AND PLASTICS . . .

**Mold Release**

Should mean less rejects and maintenance cost, greater mold life. (122A)

. . . Fast drying CD Mold Release B is intended for production work with polyester, epoxy, phenolic resins. It doesn't react with any of these or inhibit their cure. Solution is colorless, clean. Low

surface tension makes it spread quickly over entire mold surface. One application usually lasts for many cycles.—*Chemical Development Corp., Danvers, Mass.*

**Mold Release**

For plastics formed in porous and semiporous molds. (122B)

. . . Release agent for polyester, epoxy and other plastics, CD Mold Release B-2 is primarily for use on such porous materials as wood, polyesters, plaster of Paris and aluminum. The material, a companion to CD Mold Release B for non-porous surfaces, is quick-drying, thus permits fast molding cycles. Big-

gest use to date has been in manufacture of large polyester boat hulls. Manufacturer expects product to be used in automotive, aircraft and appliance industries. B-2 is supplied as paste, is insoluble in the resins, has high flash point and high heat resistance.—*Chemical Development Corp., Danvers, Mass.*

**Molding Resin**

Has improved arc resistance, yet is dimensionally stable. (122C)

. . . Resinox 3700, a thermosetting molding material, combines electrical and physical characteristics demanded by molders and end users of arc-resistant parts. Product's arc resistance has been

measured at 184 seconds in standard A. S. T. M. tests. Good dimensional stability eliminates problem of after-shrinkage.—*Monsanto Chemical Co., Springfield, Mass.*

**Phenolic Resins**

Offer advantages over other phenolics used in protective coatings. (122D)

. . . Line of phenolic resins based on R-108 chemistry impart outstanding chemical resistance to protective coatings. Known as 75120 and 75121 Methylon resins, these coating intermediates and resins have wide range of compatibility with resins commonly used in finishing plants. Free from the

tendency of conventional phenolic coatings to crater, these resins can be applied more easily and quickly. Potential uses: linings for drums, primers requiring special resistance properties, industrial coatings for chemical processing equipment.—*General Electric Co., Chemical Div., Pittsfield, Mass.*

**Plastic Blend**

High impact strength at no sacrifice in moldability. (122E)

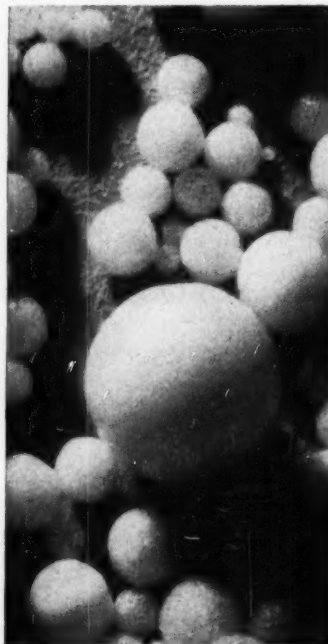
. . . Campco S-300 is essentially a mechanical mixture of polystyrene and rubber, with higher shock strength achieved through greater elasticity. Biggest advantage over chemical copolymers is in cost and dimensional stability—low water absorption. No calen-

dering is necessary. It's expected to compete in light structural applications now using conventional sheet steel, aluminum, wood, paperboard, glass and injection-molded plastics. — *Chicago Molded Products Corp., Chicago 35, Ill.*

**Plastic Foam**

Expandable polystyrene beads transformed into foam. (122F)

. . . Tiny beads of polystyrene plastic heated in a mold and ballooned to as much as eighteen times by volume yield a shaped, foamy structure of individually distinct cells. Special foaming agent built into plastic reacts to heat transforming expandable polystyrene beads into foam. Moldability and controlled density give product advantages irrespective of specific end use. Foam plastic isn't limited to processing as sheets and blocks but can be expanded in heated mold to variety of shapes and sizes in one operation. And a density can be selected which is the most desirable compromise between strength and lightness of weight. Expandability also suggests lower shipping costs. Since foam's thermal conductivity, water absorption rate, water vapor permeability and density are low, it qualifies as excellent thermal insulator. Other applications: boats, rafts and other marine equipment (providing high buoyancy), panel constructions, toys, novelties, displays. Once formed the product can be worked—sawed, planed—using either conventional woodworking tools or resistance wire.—*Koppers Co., Inc., Pittsburgh 19, Pa.*



# MICHIGAN CHEMICAL CORPORATION

## INDUSTRIAL • PHARMACEUTICAL • AGRICULTURAL CHEMICALS

From brine wells in Central Michigan, rich in bromine, sodium, calcium and magnesium, come most of the chemicals now being produced by Michigan Chemical Corporation. These chemicals are available in quantity, processed to rigid speci-

fications. Quality, strength and purity are controlled in our modern research and analytical laboratories. Michigan Chemical Corporation is a growing company you can depend upon today and in the future. Write for catalogue.

**Aluminum Bromide Anhydrous.** Technical grade, dark colored product suitable for most manufacturing uses. Highly reactive catalyst, many uses in organic synthesis especially in isomerization, bromination and halogen exchange reactions. Available as solid or lump.

**Ammonium Bromide NF IX.** A white powder, very pure, complies with all the requirements of the National Formulary. Commonly used as sedative in pharmaceutical preparations. Also in photography, textile finishing and as fire retardant for fabrics.

**Bromine, Dry.** A powerful oxidizing and brominating agent used in manufacture of dyes, pharmaceuticals. Many applications in organic synthesis. Low moisture content of 30 ppm permits use in nickel and monel equipment. Very irritating to skin, eyes. Assay 99.8%.

**Chlorobromomethane "CB".** A specially prepared pure, non-corrosive fire extinguishing fluid. Now finding increased use in factories, warehouses, homes. Clear, colorless, 2 degrees C. boiling range; complies with current military specifications. Used as solvent and in organic synthesis.

**Hydrobromic Acid.** A clear, colorless or light amber colored fuming liquid. Used for manufacture of inorganic metal bromides, aliphatic bromides, pharmaceuticals, dyes and intermediates. 48% acid and other strengths, in glass.

**Phosphorous Tribromide.** Brominating agent. A liquid, boiling point 173 degrees C., which fumes in contact with moist air. Used in synthetic work to convert alcohols to bromides, and acids to acyl bromides. Specially useful in preparation of bromides from alcohols without rearrangement.

**Potassium Bromate, Granular.** A fine, white, granular or crystalline material 99.5% pure. Decomposes at 370 degrees C. with evolution of oxygen. Strong oxidizing agent, used as an analytical reagent. Neutralizer in permanent wave compounds.

**Potassium Bromate, Powder.** A fine uniform powder with same properties as Granular. Available with added magnesium carbonate conditioning agent when specified. Suitable for use as an aging additive for flour.

**Potassium Bromide, U.S.P. XIV.** Pure, white, granular powder. Low in chloride, passes all U.S.P. requirements. Widely used in the preparation of photographic emulsions, and in lithography. One of the most important sedatives. Available in several granulations.

**Sodium Bromide, U.S.P. XIV.** Pure, white crystalline powder or granules. Passes all requirements of the U.S. Pharmacopoeia.

High assay; low in chloride. An important nerve sedative. Used in manufacture of other bromides. Contains about 77.5% bromine.

**Zinc Bromide Solution, Optical Grade.** Clear, colorless solution, about 80%  $ZnBr_2$ . Used in laboratories dealing with radioactive chemicals as a radiation viewing shield; the most satisfactory material. Meets all chemical and optical specifications of Argonne National Laboratory.

**Methyl Bromide.** A heavy, colorless liquid, vaporizing at 40 degrees F., non-flammable and poisonous. Highly penetrating and insecticidally effective fumigant. Also used in organic synthesis for the introduction of the methyl group, especially in preparation of certain pharmaceutical chemicals.

**Ethyl Bromide.** A clear, colorless, volatile liquid, specially prepared for use as an intermediate in organic synthesis. Practically free from impurities; has a narrow boiling range. Used in manufacture of dyes, perfumes and pharmaceuticals, especially barbiturates.

**Monobromobenzene.** Clear, colorless, heavy liquid. Specially prepared for use as an intermediate in preparation of organic compounds. For introduction of the phenyl radical and in Grignard-type reactions. A pure material with a 4 degrees C. boiling range; specific gravity 1.495.

**Methylene Bromide.** A clear, colorless liquid. Miscible with methyl alcohol, ether, chloroform and other organic liquids. A purified product with a 1.8 degrees C. boiling range. Specific gravity 2.47. Used in organic synthesis, as a solvent and as a heavy gauge liquid.

**Bromodichloromethane.** A clear, heavy, volatile liquid with a chloroform-like odor. Specific gravity 1.99; boiling point 90 degrees C. Soluble or miscible with many organic liquids. Used in organic synthesis. Adds to olefins under the influence of peroxide catalysts.

**Bromotrichloromethane.** A clear, colorless, heavy liquid with a chloroform-like odor. Specific gravity 2.0; boiling point 104 degrees C. Miscible with many organic liquids. Useful in organic synthesis, forming adducts with olefins with peroxide catalysts.

**Dibromochloromethane.** A clear, colorless, heavy liquid similar to bromodichloromethane. Used in organic synthesis, forming adducts with olefins under the influence of peroxide catalysts. Specific gravity 2.38; boiling point 116 degrees C.

**Trimethylene Chlorobromide.** Clear, colorless liquid used in manufacture of anesthetic

grade cyclopropane. Greater reactivity of bromine atom makes trimethylene chlorobromide specially useful also in preparation of gamma chloro compounds. Boiling range 2 degrees C. maximum.

**Cyclopentyl Bromide.** A clear, colorless liquid with an aromatic odor. Specially prepared for use in organic synthesis, particularly for introduction of the cyclopentyl radical. Many potential uses in manufacture of pharmaceuticals. Purified grade, 2 degrees C. boiling range.

**$\beta$ -Diethylaminoethyl Chloride Hydrochloride.**  $(CH_3CH_2)_2NCH_2CH_2Cl \cdot HCl$  (DEC). A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the manufacture of antispasmodic agents and other pharmaceuticals.

**$\beta$ -Dimethylaminoethyl Chloride Hydrochloride.** (DMC).  $(CH_3)_2NCH_2CH_2Cl \cdot HCl$ . A granular solid. Specially prepared for use in manufacture of antihistamines and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in Hydrochloride form.

**$\beta$ -Dimethylaminoisopropyl Chloride Hydrochloride.**  $(CH_3)_2NCH_2CH(CH_3)Cl \cdot HCl$  (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.

**Magnesium Hydroxide.** Fine, white powder, typical assay 96.3%, low in moisture, iron, alumina, silica. Technical and NF IX grades. Special bulk densities available in NF grade. Convenient material for manufacture of light magnesia, other magnesium compounds.

**Magnesium Carbonate, Basic, Technical.** Fine, uniform white powder, 325 mesh, bulk density 5.5 pounds per cubic foot. Very reactive. Used for rubber compounding, printing inks, paints, varnishes. Anti-caking agent for table salt; conditioning or bulking material for powder formulations.

**Magnesium Oxides.** Six principal grades of Michigan magnesium oxide with wide range of desirable physical and chemical characteristics covering principal uses of  $MgO$ , including rubber compounding, rayon manufacture, ceramics, glass, refractories, insulation.

**Magmaster® Magnesia Refractories.** A series of high temperature calcined magnesite refractory grains. Unusual purity of 97%  $MgO$ , low in silica, iron, alumina. Bulk density 100 pounds per cubic foot and over. For construction, lining and maintenance of open-hearth and electric furnaces.

\*Reg. U.S. Pat. Off.



Also manufacturer of Pestmaster® Insecticides, Pestmaster® Methyl Bromide Fumigant and Dustmaster® Road Chemicals.

## MICHIGAN CHEMICAL CORPORATION

Saint Louis, Michigan

EASTERN SALES OFFICE: 230 Park Avenue New York 17, New York

BASIC MANUFACTURER OF INDUSTRIAL, PHARMACEUTICAL AND AGRICULTURAL CHEMICALS

RESINS AND PLASTICS . . .

**Plastic Ropes**

Resist most acids, alkalis. (124A)

. . . Plastic rope is made from polyethylene and Mylar plastic films. Having all behavior characteristics of natural fiber ropes, products are totally unaffected by most acids, alkalis, specifically

including sulfuric acid. Standard coil lengths made up in diameters up to 1 in., with larger diameters produced for special jobs.—*U. S. Plastic Rope, Inc., Redwood City 7, Calif.*

**Plastelizer**

Combines with DOP to plasticize PVC at lower cost. (124B)

. . . Combinations of an aromatic acid-based product and di-2-ethylhexyl phthalate (DOP) are used to plasticize polyvinyl chloride. Advantages: better low temperature properties than DOP

alone; low volatile loss; lower soap extraction loss; less tendency to mar lacquer surfaces; lower cost than other low temperature auxiliary plasticizers.—*Atlas Powder Co., Wilmington, Del.*

**Plastelizer**

For pigmented and colored vinyls; low cost and nontoxic. (124C)

. . . Extender-type plasticizer for vinyls is trade-named HB-20. Material is partially hydrogenated alkyl-aryl hydrocarbon; also shows promise as plasticizer for polystyrenes, ethyl cellulose and

asphaltic compositions. Cost is lower than several similar products. Plasticizer is water white, high boiling, almost odorless.—*Monsanto Chemical Co., Phosphate Div., St. Louis 4, Mo.*

**Plastelizer**

General purpose, low volatility plasticizer for PVC; priced to compete with DOP. (124D)

. . . Diisodecylphthalate (DIDP), a clear oily liquid, is less than half as volatile as di-2-ethylhexyl phthalate (DOP). Processing techniques for product are similar to DOP, except that slightly higher calendaring, extruding and dry blending temperatures may be required.

Note that while original low temperature flexibility of DIDP-plasticized sheet is slightly inferior to that made with DOP, sheets have superior flexibility 2 days after going through SPI extended volatility test.—*Monsanto Chemical Co., St. Louis 4, Mo.*

**Plastelizer, Hygroscopic**

Even control. (124E)

. . . Retane is compatible with many papers, rubber latices, fibers, glues, starches. Degree of softness and flex-

ibility can be controlled. A polyalcohol furnished as 70% solids in water—*Bonner Chemicals, Inc., Leominster, Mass.*

**Plastelizer, Vinyl**

Improves stability, permanence of vinyl compounds. (124F)

. . . Pittsburgh PX-800, an epoxy plasticizer, offers advantages over ordinary plasticizers in permanence and volatility. Because it's an epoxy, PX-800 can serve in vinyl compounds as a stabilizer to

both heat and light. Vinyl formulations containing PX-800 exhibit excellent resistance to extraction by oil, gasoline and soap solution.—*Pittsburgh Coke & Chemical Co., Pittsburgh, Pa.*

**Plastelizers**

Give low-temperature flexibility to polyvinyl chloride resins. (124G)

. . . Two low-temperature plasticizers for polyvinyl chloride resins, DOA—di-(2-ethylhexyl) adipate—and DNODP—di-n-octyl, n-decyl phthalate, are commercially available. DOA imparts excellent low temperature flexibility, heat stability, is useful for controlling vis-

cosity of plastisols. DNODP is most economical quality plasticizer for obtaining good low-temperature flexibility, low volatility, water resistance. It, too, imparts excellent viscosity characteristics to plastisols.—*Monsanto Chemical Co., St. Louis 4, Mo.*

**Plastelizers, Vinyl**

Less volatile. (124H)

. . . Two plasticizers for vinyl compounds, Cabflex ODP (iso-octyldecyl phthalate) and Cabflex ODA (iso-octyl-

decyl adipate), are priced no higher than octyl esters, but are less volatile.—*Godfrey L. Cabot, Boston, Mass.*

**Plasticizing Polyol**

Maintains texture in glues, paper products, tobacco. (124I)

. . . Atlas G-2401, 85% aqueous solution of technical hydroxypropyl sorbitol, is less hygroscopic than glycerol, retains appreciable viscosity while holding relatively large amounts of water, does not crystallize under normal operating conditions, has narrow humectant range. Suggested uses: softener in glue

specialties, conditioner for paper products, shoe dressings, tobacco. Hydroxypropyl sorbitol—compared with glycerol as glue plasticizer—gives higher viscosities at equal water content, less tacky films, higher tensile strengths. Setting temperatures are almost equal.—*Atlas Powder Co., Wilmington 99, Del.*

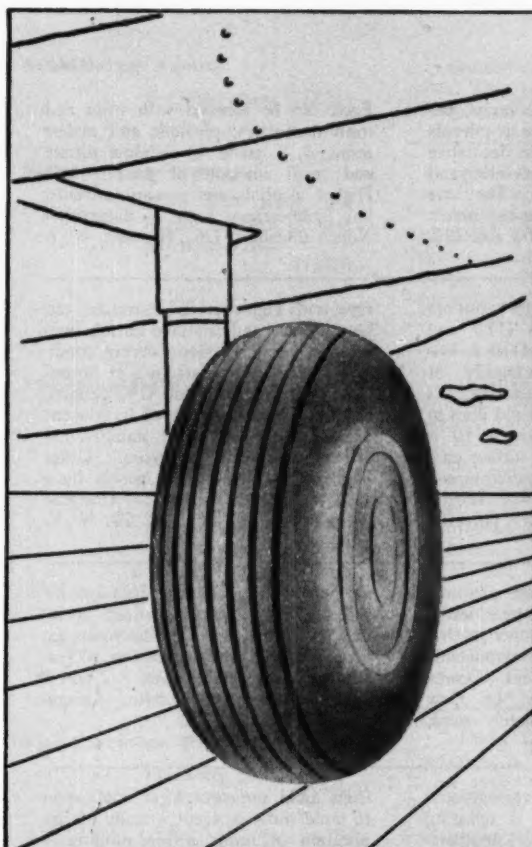
**Polyamide-Epoxyes**

Highly flexible; useful as protective coatings. (124J)

. . . Thermosetting resins—blends of epoxy and polyamide resins—prove to be very flexible coatings not only for wood and metal, but also for paper, cardboard, metal foils and plastics film. Recommended uses include mainte-

nance finishes, masonry paints, electric insulation varnishes. Use in adhesives, castings, plastic parts in electrical equipment and glass reinforced plastics also looks promising.—*General Mills Inc., Minneapolis, Minn.*





## FORTUNATE ACCIDENT

In 1839 rubber wasn't much use. It melted and oozed in hot weather. In cold it stiffened and cracked. To remedy these failings, Charles Goodyear worked ardently but unsuccessfully. Yet he kept on. And the final solution of the problem came by accident when onto a hot stove Goodyear spilled a mixture of latex and Sulphur. This was the birth of vulcanization.



In the years since then, Sulphur has contributed further to rubber's versatility. By varying the proportion of Sulphur in the vulcanization mix, the properties of the rubber are changed — ranging from the battery case's rigidity to the rubber band's flexibility. And when supplies of natural rubber were cut off by war, Sulphur in various forms was found to be a most important element also in the production of synthetic rubbers.

*FREEPORT SULPHUR COMPANY, oldest United States producer of crude sulphur, has been supplying this essential raw material for over 35 years.*

## FREEPORT SULPHUR COMPANY

OFFICES: 161 East 42nd Street, New York 17, N. Y. • MINES: Port Sulphur, Louisiana • Freeport, Texas

## RESINS AND PLASTICS . . .

### Polyamide Resins

Can be used in many types of coatings, including waterproof, grease-proof. (126A)

. . . Three polyamide-type resins, the Nopcote series, are available as solvents and hot-melt applications in decorative greaseproof, waterproof heat-sealing and water-vapor-proof coatings. They are designated by their softening points (deg. C.); Nopcote 45, 105 and 190.

Each can be blended with rosin and rosin derivatives, phenolic and maleic resins, S. S. grades of cellulose nitrate and small amounts of paraffin wax. Higher alcohols are primary solvents, but hydrocarbons serve as diluents.—Nopco Chemical Co., Harrison, N. J.

### Polyester Resins

One is self-extinguishing; two others used in low-temperature curing. (126B)

. . . Three improved polyester resins are Laminac 4110, Laminac 4111 and Laminac 4147. Laminac 4110 is low viscosity type designed primarily for low temperature curing applications. It's not affected by air exposure and dries to completely tack-free surface. 4110 is recommended where good surface cure and water resistance are required in end product. Laminac 4111, a low viscosity styrene monomer modified polyester

resin with high chemical resistance, can be promoted and catalyzed for low temperature or atmospheric curing conditions. Used in manufacture of fibrous glass laminates. Laminac 4147 permits, for first time, fabrication of translucent panels having both light stability and self-extinguishing properties. Other light stabilized polyester panels burn even after flame removal.—American Cyanamid Co., New York 20, N. Y.

### Pre-Processed Resins

Highly purified and analyzed to eliminate resin as process variable. (126C)

. . . Ion exchange resins are pre-processed to provide a source of pure, ready-to-use resins with known properties that will allow standardized, reproducible procedures to be carried out. Dowex starting material, supplied by Dow Chemical, is more completely sized,

purified by alternate acid, base and organic-solvent cycles and defined by individual batch analysis. Four resins are available processed from Dowex 50 (cation exchange) and Dowex 1, 2 and 3 anion exchange. —Bio-Rad Laboratories, Berkeley 9, Calif.

### Release Agent

Removes epoxy resins from molds. (126D)

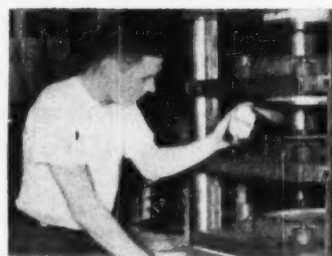
. . . H-561-B replaces conventional waxes and silicone resins in releasing epoxy resins—particularly low temperature-setting, amine-hardening types—

from mold surfaces. After application to mold surfaces, agent is ready for application of resins within minutes.—Furane Plastics, Los Angeles 39, Calif.

### Release Agent, Liquid

All-purpose type dries quickly to hard, smooth, glassy finish. (126E)

. . . Vin-Rock Type R-2, speeds production of plastic products, cuts production costs. It's equally effective with phenolics, ureas, melamines, polyesters or epoxy resins. Designed for compression molding, laminating, casting and lay-up molding, product is packed in Aerosol cans for easy spraying. Number of cycles obtained between applications is usually greater than with other release agents.—Vin-Rock, Inc., Cleveland, Ohio.



### Resin Concentrate

Of formaldehyde and urea in water. (126F)

. . . UF Concentrate-85, raw material for resins, is composed of 61% formaldehyde and 24% urea in water. Solution allows resins manufacturers to charge large quantities of resin-forming ingredients to each kettle since water

has been "squeezed out." Batches are thus increased. Process time is cut because of shorter time required for dehydration. Existing equipment can be used.—Allied Chemical & Dye Corp., New York 6, N. Y.

### Resin Raw Material

Its resins are superior to those of urea, inferior to melamines. (126G)

. . . Biuret,  $H_2NCONHCONHNH_2$ , is urea-like material available in experimental quantities for evaluation by resin manufacturers. Uses for its resins are expected in molding powders, tex-

tile and paper treating. If and when product is put out in tonnage quantities, it will have a price tag of 10¢/lb.—Allied Chemical & Dye Corp., Nitrogen Div., New York 6, N. Y.

### Silicone Resin

Glass laminates bonded with resin have 100 times dielectric life of competitors (126H)

. . . Silicone-glass laminates bonded with Dow Corning 2105 Resin and used in transformer tubes, maintain original dielectric strength after aging over 1,000 hr. at 250 C. And laminate production is easier with 2105: tem-

peratures of 175 to 250 C., pressures of 300 to 1,000 psi, can be used. Special catalyst, XY-15, is supplied to accelerate setting of 2105. Shelf life of catalyzed resin—as long as 2 months.—Dow Corning Corp., Midland, Mich.

**Stabilizing Agents**

For vinyl resins. (127A)

**Styrene Copolymers**

Have 8-10 times the impact strength of best polystyrene resins.

(127B)

**Thermoplastic Resins**

For chemical, mechanical and electrical applications.

(127C)

**Vinyl Acetate Plasticizer**

Flexibility retained during aging.

(127D)

**Vinyl Copolymers**

"Built-in" plasticizer is derived from inedible animal fats.

(127E)

... Duranyl compounds stabilize vinyl resins. They prevent discoloration during aging, molding, exposure to sun-

... Plio-Tuf is name of two high-styrene copolymer resins for molded and extruded products. The first, Plio-Tuf G85C, is thermoplastic resin with softening point of 90 C. and Shore D hardness of 85. Plio-Tuf G75C has same softening point, but a hardness of 75. Both resins can be pigmented

... Rivchlor (rigid vinyl), an unplasticized thermoplastic, has good chemical resistance, high impact strength and good fabricating characteristics. Use: pipes, fittings, tank linings. Dur-Acc, a thermoplastic multipolymer, has high impact strength, good dimensional stability, and chemical resistance. Uses: formed and draw-molded parts. Ace-Flex, flexible and lightweight, has good chemical resistance and electrical properties. Uses: laboratory lines, bottle filling machinery.—American Hard Rubber Co., New York 13, N. Y.

... Darex Everflex, a vinyl acetate copolymer, is "internally plasticized." It has permanent plasticity, eliminating need for additional plasticizers.

... Vinyl stearate, produced from inedible animal fats, is big feature of vinyl chloride copolymers developed by U. S. Dept. of Agriculture. Chemically bound in copolymers, vinyl stearate acting as plasticizer cannot migrate or evaporate. Copolymers can be either rigid or flexible, depending on amount

light. If used at 4 to 5%, they also destaticize vinyl permanently.—Altraminc Corp., Los Angeles 22, Calif.

in conventional equipment. Due to their natural thermal stability, they don't require additional curing agents, accelerators, etc. For higher impact strength or fire retardant properties, resins can be plasticized with GR-S or Neoprene rubbers.—Goodyear Tire & Rubber Co., Akron, Ohio.



Product doesn't lose flexibility through aging, migration or volatility of conventional plasticizer.—Dewey & Almy Chemical Co., Cambridge, Mass.

of stearate included. Flexible variety are similar to combinations of polyvinyl chloride and commercial plasticizers. Rigid types have lower milling temperature and lower bulk viscosity temperature coefficient than other commercial vinyl plastics.—U. S. Dept. of Agriculture, Washington, D. C.

## Looking for Something?

Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and tech-

nology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information—fast—on products and services.

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## RESINS AND PLASTICS . . .

## Vinyl Films

For food and chemical packagings; impermeable and flexible. (128A)

. . . Two vinyl film liners, K-flex BV and K-flex DV, prevent migration of fats and oils through packagings. BV, from Goodrich's Geon polyblend, is grease-resistant above 0 F. Tensile strength: 2,200 psi.; elongation: over 200%. DV from straight Geon vinyl resins, is designed for non-fat use at

temperatures as low as -40 F. Tensile strength: 2,000 to 3,500 psi., elongation: over 200%. Both are nontoxic, impermeable, noncombustible, resistant to abrasion and most corrosive chemicals, and flexible at high and low temperatures.—B. F. Goodrich Chemical Co., Cleveland 15, Ohio.

## Vinyl Plastic

Replaces metal alloys in filter unit. (128B)

. . . Because of high corrosion resistance and lower cost, vinyl plastic is used for leaf filter frames and rollers holding frames in place. Typical: filter—designed by Hercules Filter Corp.—that

separates heavy manganese dioxide sludge from hot solution of sulphuric acid. Cost of plastic is  $\frac{1}{4}$  that of special metal alloys.—B. F. Goodrich Chemical Co., Cleveland 15, Ohio.

## Vinyl Resin

Has good dry-blending properties. (128C)

. . . Pliovic DB80V, a new grade of vinyl resin, has exceptionally good dry blending properties because of its particle size and shape. Free-flowing, dry

mixes can be obtained without using high heat or lengthy milling cycles.—Goodyear Tire & Rubber Co., Akron 16, Ohio.

## Vinyls, Heat-Stable

Used in dry blends for injection moldings. (128D)

. . . Opalon 300 series, a line of heat-stable vinyl resins for injection molding, is adaptable to dry blending processes. Molders can save up to 25% on material costs by making their own blends. Opalon 300 also offered in eight ready-made blends, containing plasticizer, filler, stabilizer and lubricant. These can be drum-tumbled with

dry pigments to produce wide range of colors. Because dry blending takes place at relatively low temperatures, compounds reach injection press with minimum of heat history. Thus tendency toward decomposition, with attendant mold and machine corrosion, is reduced.—Monsanto Chemical Co., Springfield, Mass.

## Wet-Strength Resin

For paper stock. (128E)

. . . PR-165 resin is designed to improve wet strength, folding endurance and scuff resistance of paper stock, can

be used for any type of pulp. It cures very rapidly.—The Borden Co., Chemical Div., New York 17, N. Y.

## ● Rubber and Rubber Chemicals

## Accelerator, Rubber

"Delayed action". (128F)

. . . Nobs Special accelerator protects rubber compounds against processing scorch by not catalyzing vulcanization until rubber in mold is heated to proper

temperature. Delay—up to 10 minutes—allows longer rubber flow in mold, reduces flow cracks.—American Cyanamid Co., Bound Brook, N. J.

## Activator

For faster GR-S cold rubber formulation. (128G)

. . . Phenylcyclohexyl hydroperoxide, available in experimental quantities, is an activator for GR-S cold rubber formulation, has been used to prepare cold GR-S rubber in less than 20 min. at

41 F. Product may be good as polymerization catalyst for applications such as styrenated polyesters.—Monsanto Chemical Co., Phosphate Div., St. Louis 4, Mo.

## Activator

Can save rubber industry \$700,000 per year. (128H)

. . . Chemical activator promising reduced cost of GR-S cold synthetic rubber is a sulfoxylate derivative. Pilot plant tests indicate activator greatly simplifies cold rubber production, can

be used in either cold latex or solid cold rubber recipes. Speeds up production, makes a more uniform product.—U. S. Rubber Corp., Naugatuck Chemical Div., New York 20, N. Y.

## Anti-Tack Agent

Zinc stearate. (128I)

. . . Liquizinc, a highly concentrated and dispersible zinc stearate, is recommended as an anti-tack agent which is absorbed in rubber milling and com-

pounding operations and thus allows stock to run cooler and much more smoothly.—Rubba, Inc., New York 60, N. Y.

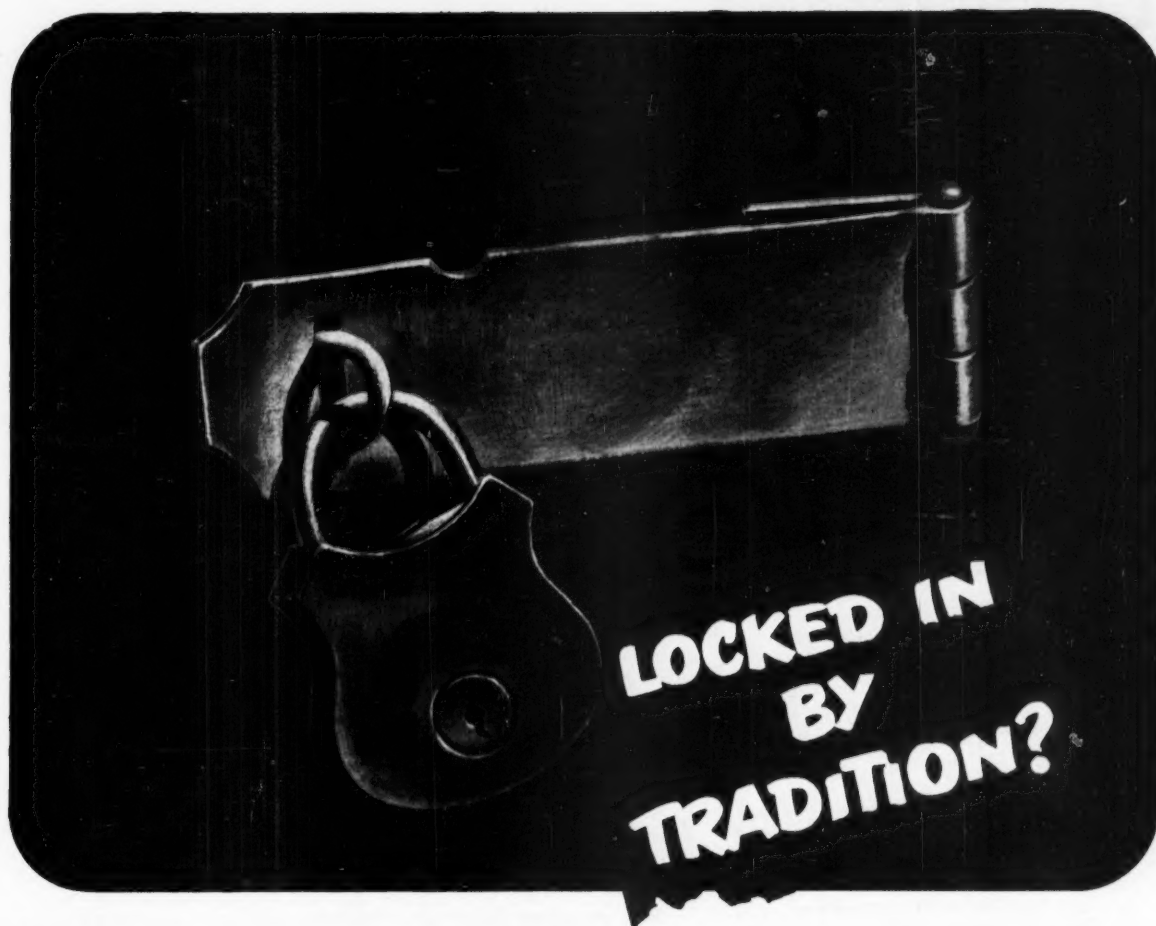
## Buna N Compound

For -40 to 325 F. (128J)

. . . Compound 1225, a development of Buna N, has good heat resistance, good oil resistance and low compression

set at high temperatures (300-325 F.). It's flexible as low as -40 F.—Goshen Rubber Co., Goshen, Ind.





## Make use of the Unique Advantages of TONNAGE OZONE in your Oxidations.

You may have been limited in the past to traditional solutions of your oxidation problems . . . but now you are free to consider the value of this outstanding new approach—Welsbach's Tonnage Ozone.

Ozone has always been regarded as a powerful oxidizing agent but there were problems—availability and dependability. Now those problems have been answered—with low-cost Tonnage Ozone, produced where it is used . . . by dependable Welsbach Ozonators.

Just consider these unique advantages—advantages which only Welsbach Ozone can offer!

1. No procurement problems. No freight, storage or materials handling expense. Welsbach Ozone is generated where it is used.
2. Fully automatic for continuous processing—maintenance costs are negligible. And since the only raw materials needed are electricity and air or oxygen, operating costs are constant and predictable.
3. Inorganic reaction with ozone is quantitative and instantaneous. And, since only oxygen is added, no post-oxidative clean-up is needed.
4. Ozone cleavage of unsaturated organic compounds is very specific, resulting in

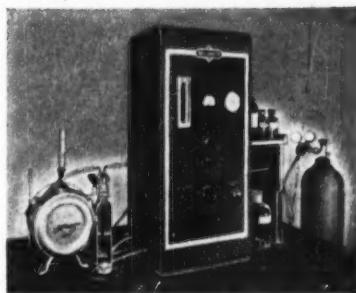
higher yields of purer products at a lower cost.

5. Ozone can act as a catalyst in oxygen or air oxidations without requiring high temperatures and pressures.

And now . . . here's an easy way to find out what Welsbach Ozone can do for you.

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The Welsbach T-23 Laboratory Ozonator is designed specifically as a precision laboratory instrument capable of constant and reproducible operation, positively safe to use. It effects substantial savings in research through more efficient use of your chemists' time and more rapid completion of the project. Write today for descriptive folder on the Model T-23 and, if you wish, indicate the nature of your problem. The Welsbach Corporation, Ozone Processes Division, 1500 Walnut Street, Philadelphia 2, Pa.



Welsbach Model T-23 Laboratory Ozonator—Gives constant, reproducible operation with no ozone leaks, no electrical hazards and offers substantial savings in research time and money. Its many exclusive features have made it standard equipment where rapid efficient research is essential.

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**ZONE IS TONNAGE OZONE**  
 LOW COST • DEPENDABLE

**RUBBER AND RUBBER CHEMICALS . . .**

**Carbon Black**

25% more mileage.  
(130A)

. . . Aromex 125, a super-abrasion furnace black, is characterized by fine particle size with high structure. Tests

show improved resistance to chipping and cracking.—J. M. Huber Corp., Borger, Tex.

**Carbon Blacks**

Two types. (130B)

. . . Elf 75 gives greater flow and flexibility in formulations because of extra volatility. Elf 75 Densad's increased

density means lower shipping costs, storage space.—Godfrey L. Cabot, Inc., Boston, Mass.

**Chlorinated Rubber**

Gives coating that withstands severe corrosive conditions. (130C)

. . . A formulation of unmodified chlorinated rubber, Erchlor 1900, meets plant corrosion conditions where ordinary chlorinated rubber finishes are not adequate. Product is recommended for use on brown stock washers in pulp

mills, on pumps and motor bases, for outside structures and machinery. It's nonflammable, can be used on metal, wood, concrete. Erchlor 1900 is easily applied by brush.—Earl Paint Corp., Utica 2, N. Y.

**Extender**

Coated ultrafine calcium carbonate solves dispersion problems. (130D)

. . . Purecal SC is a unique coated CaCO<sub>3</sub> that doesn't retard cure of rubber yet has same excellent qualities as those attributed to uncoated ultrafine carbonates. Made for easy dispersion

without special handling. Purecal SC eliminates master-batching. Producer predicts better rubber products, such as GR-S, at lower cost.—Wyandotte Chemicals Corp., Wyandotte, Mich.

**Film**

Combines properties of plastics and man-made rubber. (130E)

. . . Vulcafilm, a rubber film that can be electronically sealed to itself, permits assembly of vessels of any size with fused, homogeneous seams throughout. "Welded" seams are stronger than the material itself; neither cementing nor taping is needed. Main use has been

in the manufacture of oil tank diaphragms—to eliminate evaporation from stored petroleum products. Vulcafilm can be reinforced with many fabrics or modified to obtain resistance to oil, gasoline, heat, acid.—B. F. Goodrich Co., Akron, Ohio.

**Flowable Rubber**

For adhesives, conductive rubber. (130F)

. . . First free-flowing synthetic rubber, a liquid copolymer of butadiene acrylonitrile (27%), is DPR Synthetic N-27. Product will be used as raw ma-

terial for plasticizing or modifying plastics, synthetic resins and rubber and also to rubberize resins.—DPR, Inc., Belleville, N. J.

**Furnace Black**

Increases tire tread mileage. (130G)

. . . Intermediate super abrasion furnace (ISAF) black is designed to give passenger car tire treads increased mileage under severe present-day conditions.

This new grade fills gap between Phil-black O (HAF) and Phil-black E (SAF).—Phillips Petroleum Co., Bartlesville, Okla.

**Kel-F Elastomer**

Has exceptional chemical and heat resistance (-15 to 400 F.) (130H)

. . . Kel-F (trifluorochloroethylene) in elastomer form is moving into pilot plant stage. Potential uses include fuel hose, tank linings, gaskets, seals, coatings for clothes used in corrosive material handling and for paper, wood and

metal. Withstands fuming nitric and sulfuric acids, hydrocarbon fuels and lubricants, oxygen, ozone and sunlight. It's also nonflammable, tough and heat resistant.—M. W. Kellogg Co., Jersey City, N. J.

**Powdered Rubber**

Costs less, processes easier. (130I)

. . . Flow-Mix, powdered reclaimed rubber, costs about 10% less than conventional slabs of reclaim and about 75% less than powdered natural rubber. Mixing time is reduced, handling

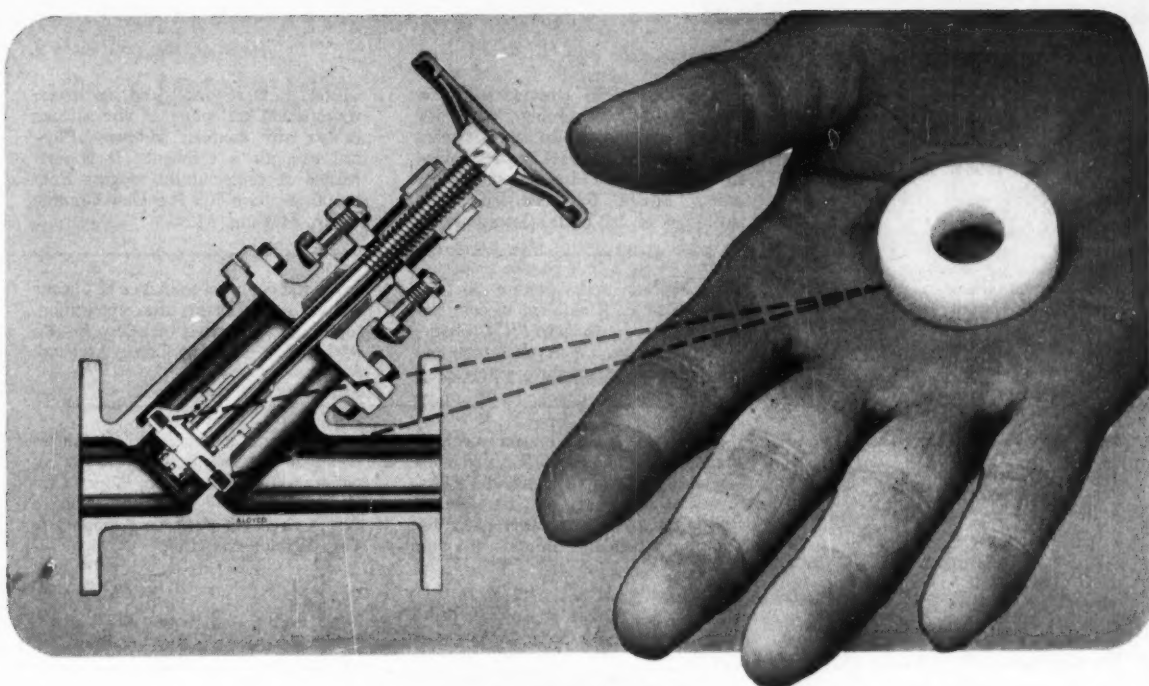
and shipping are made easier. Potential markets: blends of rubber and asphalt, rubber and plastics, rubber and cork.—U. S. Rubber Reclaiming Co., Buffalo, N. Y.

**Resin, Rubber-Like**

Structure similar to natural rubber; blends easily with natural and synthetic rubbers. (130J)

. . . High compatibility with natural rubber, GR-S, Neoprene, butyl and other synthetics makes Solarite Resin #11 valuable to rubber compounders. Product is easily incorporated, dispersed and processed without "mushiness" and maintains flexibility despite severe aging or exposure to ozone. It's suitable for pure gum or highly loaded stocks, has good electrical properties. Stocks processed with Resin #11 possess marked

freedom from scorching and bin-curing and maintain viscosity over extreme temperature variations. Neoprene, GR-S and butyl rubbers compounded with Resin #11 show up favorably against those using competitive resins, have better elongation characteristics, greater tensile strength. Resin #11 can be produced in quantity from available domestic materials.—Solar Compounds Corp., Linden, N. J.



## Discs of Du Pont **TEFLON**<sup>®</sup> resist high heat and acid, give 6-8 times longer service

### Processors can reduce downtime maintenance costs with "Teflon"

In one chemical plant, Y-valve discs for fatty acid service at temperatures up to 475°F. were a source of trouble. They would deform and wear down in short order, making tight sealing against vacuum impossible. After switching to renewable discs of "Teflon,"\* the manufacturer increased service life for these parts 6 to 8 times. Maintenance time and costs have been considerably reduced, valve operation is more efficient.

Why is the service performance of "Teflon" so remarkable? Its coefficient of friction is extremely low and stays constant through changes in temperature. It has good impact strength and abrasion-

resistance under normal conditions of speed and load. Toughness and flexibility are retained at temperatures as low as -450°F. Continuous service up to 500°F. is possible. "Teflon" has zero water absorption — won't shrink, swell, crack or harden in moisture. To climax this remarkable set of properties, "Teflon" is inert to *all* chemicals except molten alkali metals and fluorine at high temperatures and pressures.

Have you investigated the properties of "Teflon" and the other members of the Du Pont family of engineering materials — "Alathon"\* polyethylene resin, "Zytel"† nylon resin and "Lucite"\* acrylic resin? For further information on the properties and uses of these materials, mail the coupon below.

(Valves and discs manufactured by Alloy Steel Products Co., Linden, New Jersey)

\*Registered trade-mark of E. I. du Pont de Nemours & Co. (Inc.)  
†"Zytel" is the new trade-mark for Du Pont nylon resin.



E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department  
Room 259, Du Pont Building, Wilmington 98, Delaware

Please send me more information on Du Pont "Teflon" tetrafluoroethylene resin:  
Uses ☐; Processing Techniques ☐; Properties ☐. I am also interested in receiving more information on:  
"Zytel" nylon resin ☐; "Alathon" polyethylene resin ☐; "Lucite" acrylic resin ☐.

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Title \_\_\_\_\_  
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Street Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_  
Type of Business \_\_\_\_\_



## RUBBER AND RUBBER CHEMICALS . . .

**Silicone Rubber**

Has lowest long term shrinkage of any silicone rubber stock. (132A)

. . . Silastic 675's expected use is in stock for gaskets, O-rings, seals and molded industrial goods. Where tolerances aren't too close, it can be molded in dies designed for organic rubber parts. Silastic 675 has long term shrinkage of 1.8-2.5% (lowest of all

silicone rubber stocks) and has lowest compression set values of any silicone rubber with nontoxic additives. Physical strength is excellent. It is serviceable at temperatures ranging from -100 to above 500 F.—Dow Corning Corp., Midland, Mich.

**Silicone Rubber**

Vulcanizes at room temperature; develops properties in 24 hr. (132B)

. . . Neither heat, pressure nor full exposure to air is required to cure sections up to  $\frac{1}{8}$ -in. thick of RTV Silastic, a silicone rubber. It develops high and low temperature stability, water repel-

lency and chemical resistance of silicone rubber within 24 hr. after application. Optimum properties develop in 4-7 days.—Dow Corning Corp., Midland, Mich.

**Tire Cord, Rayon**

Tougher, more fatigue resistant than other rayon cords. (132C)

. . . A high-tenacity rayon yarn for tire cord, Super Cordura, is available for use in all kinds of tires and in V-belts. Yarn is 20% stronger, has greater fatigue resistance than other yarns like Du Pont's regular Cordura. It's also

more resistant to moisture. Instead of completely non-uniform filaments of conventional viscose yarn, Super Cordura is essentially same from skin to core.—E. I. du Pont de Nemours & Co., Wilmington, Del.

## • Surface Active Agents

**Defoamer**

Instantly blankets foam with finely divided silicone. (132D)

. . . Silicone spray-dispersion of Anti-foam A in Freon eliminates time lost waiting for inhibitor to become effective by instantly blanketing foam with finely divided silicone, breaking it

within seconds. Effective concentrations of silicone are well below FDA food limit of 10 ppm. Defoamer is usually undetectable in finished batch.—Dow Corning Corp., Midland, Mich.

**Desiccant, Activated Alumina**

Has high sorptive properties for drying natural gas. (132E)

. . . New long-life desiccant, Activated Alumina H-151, is a specially prepared amorphous gel of activated alumina in ball form. Field tests under heavy-duty service conditions showed superi-

ority over the major competitive gel desiccant, particularly in rate of decline in sorptive capacity and particle breakdown.—Aluminum Co. of America, Pittsburgh 19, Pa.

**Desiccant, Hydrated Alumina**

Non-corrosive; removes moisture, acid from refrigerating units. (132F)

. . . An-Drite, a new desiccant, is chemically treated gelatinous aluminum oxide hydrate in  $\frac{1}{8}$ -in. diameter spheres. Product does not plug or channel and is efficient at temperatures up to 140 F.

Is important part of new refrigeration dryer unit, Ansul T-Flo, used where excess moisture affects machine performance.—Ansul Chemical Co., Marinette, Wis.

## Your Inventory of New Chemicals and Materials

**What It Contains . . .**

This inventory digests some 252 of the most important new, improved or newsworthy chemical products developed or commercialized during the second six months of 1953 and the first six months of 1954. It includes only those products of major signifi-

cance or prime interest to chemical engineers in the chemical process industries.

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**Desiccant, Silica Gel**

Removes water and acids from refrigeration systems. (133A)

... PA-400, a high efficiency refrigerant desiccant, has twice the moisture adsorbing capacity of its predecessor, PA-100. Presence of more than 40 parts per million of moisture in a refrigerant is likely to cause freezups,

copper plating and corrosion of the system. PA-400 removes this troublesome water. It's also effective in removing HCl and HF formed by reaction of water and refrigerant.—*Davison Chemical Corp., Baltimore 3, Md.*

**Detergent**

Tallow-based. (133B)

... First tallow-based synthetic detergent, a 26% active slurry form of Igepon, is offered at 94¢ per lb. Gives

high performance at lowest possible cost.—*Antara Div., General Dyestuff Corp., New York 14, N. Y.*

**Emulsifiers**

For pesticides like Methoxychlor, DDT & lindane. (133C)

... Four emulsifiers for formulation of liquid insecticidal and herbicidal concentrates satisfy most of the emulsifier requirements of the newer pesticides. (1) T-H Emulsifier C-I, most water soluble of series, is designed for the emulsification of chloro IPC. (2) T-H Emulsifier D-I, least water soluble and most oil soluble of series, is suited for preparing DDT and benzene hexachlor-

ide emulsions and for making Methoxychlor and Rothane concentrates. (3) T-H Emulsifier M-I imparts good emulsion characteristics to concentrates containing lindane, dieldrin, aldrin and heptachlor. (4) T-H Emulsifier W-I emulsifies chlordane, toxaphene, parathion and esters of 2,4-D and 2,4,5-T.—*Thompson Hayward Chemical Co., Kansas City 8, Mo.*

**Gel, Synthetic**

Aqueous solution congeals under alkali treatment. (133D)

... Unique gel-forming gum, Carbopol 934, is a hydrophilic polymer which dissolves in water to form low-viscosity, low pH solutions. These, when neutralized, congeal to high viscosity gels. High viscosity gels are attainable with lower concentrations of

Carbopol than with many other commercial thickening agents. Solutions of one-half, one and three percent reach viscosities of 10,000, 30,000, and 70,000 centipoises, respectively.—*B. F. Goodrich Chemical Co., Cleveland 15, Ohio.*

**Gelling Agent**

Has strong, needle-like particles; for thickening greases. (133E)

... Permagel, low-cost bodying agent, is an entirely inorganic colloidal form of the mineral, attapulgite. It can gel a wide range of petroleum oils and synthetic lubricants at a low cost per pound

of finished grease. Uses of the pure, grit-free product are in pharmaceuticals, rubber, paint, inks, textiles, insecticides. — *Attapulgis Mineral & Chemicals Corp., Philadelphia 5, Pa.*

**Guar Gum**

Natural hydrophilic colloid; valuable to food, drug, cosmetic industries. (133F)

... For first time, refined guar gum is available in unlimited quantities. Excellent cold water swelling is top feature of Jaguar gum. Also swells in gastric and intestinal fluids, produces high viscosity at low concentrations over wide pH range. Properties suggest use as

bulk forming agent in laxatives and as tablet-disintegrating agent. Jaguar gum's high water holding capacity, shock resistance and smooth texture make it useful as a stabilizer for food products.—*Stein, Hall and Co., Inc., New York, N. Y.*

**Low-Suds Detergent**

Alkyl-aryl sodium sulfonate bids for cleaning market. (133G)

... Low-sudsing detergent, Udex, is stable in alkaline solutions to pH of 11.5, instantly soluble in water and most acids and blends easily with builders. Udex is made from low cost petroleum cuts which are converted to a mixture of alkyl-aryl sodium sulfonates, said to be better than a pure compound for many applications. Household customer demands for white detergents (Udex is tan) will limit product, initially, to industrial use: laundries, metal cleaning, bottle washing.—*Universal Detergents, Inc., Long Beach 6, Calif.*



**Sodium Polyphosphate**

Has lower pH and higher P<sub>2</sub>O<sub>5</sub> content than predecessors. (133H)

... Metafos, similar to manufacturer's Quadrafos, is a condensed sodium polyphosphate. Metafos has 67% P<sub>2</sub>O<sub>5</sub> (vs. 63.5% for Quadrafos), a lower pH in solution, and costs no more. Biggest tonnage use of polyphosphates is as a viscosity controller for oil well drilling muds. Since allowable alkalinity limits

for this operation are very narrow, it's expected that drillers will be able to use Quadrafos until the upper limit of alkalinity is reached and then switch to Metafos until the lower limit is approached. Metafos can be used in detergents. — *Rumford Chemical Works, Rumford 16, R. I.*

**SURFACE ACTIVE AGENTS . . .**

**Wetting Agent**

For preparation of variety of emulsions and dispersions. (134A)

. . . Monawet Mo is claimed to be most economical wetting agent now produced and can be used wherever penetration, wetting out or depression of surface tension are required. Some applications require as little as 0.01% active material. Product is sodium salt

of di-(2-ethylhexyl)-sulfosuccinic acid, is stable indefinitely in cold or hot water. Stability is good in solutions with pH range from 5 to 9. Monawet Mo is available in paste, liquid and gel forms.—Mona Industries, Inc., Paterson 4, N. J.

**• Textile Chemicals and Synthetic Fibers**

**Detergent**

Low cost. (134B)

. . . Nopco 1479A claims to be lowest cost synthetic detergent on market for textiles. A liquid fatty alkylolamide, it

has high foaming action, excellent scouring properties.—Nopco Chemical Co., Harrison, N. J.

**Dyes**

Simultaneous embossing and printing of cellulosic textiles. (134C)

. . . Emboprint colors, dyes that stand up well under high temperature processing, make possible a new field of cellulosic textile printing, simultaneous

embossing and printing. Emboprint dyes are fast to dry cleaning and laundering.—Metro Dyestuff Corp., West Warwick, R. I.

**Flame Proofing for Cotton**

Repeatedly laundered, drycleaned without losing fire-proofing properties. (134D)

. . . Permproof 300, chemical impregnant for cottons, provides a lasting finish impervious to combustion up to 4,500 F. There's no afterglow with new cloth and very little occurs even after 12 washings. Permproof 300, a

mixture of thermoplastic and thermosetting resins, is prepared as a water dispersion of high solids content and can be diluted without coagulating.—Treedale Laboratories & Textile Processing Co., Pittsburgh, Pa.

**Flame Retardant**

Can be applied to most cellulose. (134E)

. . . X-12, a renewable flame retardant replacing manufacturer's CM retardant, improves dye fastness when applied to cloth and paper. It overcomes disadvantages of ammonium-based chemicals that weaken textiles. Buffered action

keeps pH high even at elevated temperatures. White, crystalline X-12 is water soluble and excess solution can be safely stored for future use.—E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

**Rayon, High-Tenacity**

Gives increased strength to tire cord and textile fabrics. (134F)

. . . Rayocord-X, high-tenacity rayon yarn made exclusively from chemical cellulose, has highly-oriented "all-skin" filaments which impart toughness and excellent shock resistance to tire cord. Other markets: rayon fabrics and rein-

forcing agent for plastics. Rayocord's high strength and lowered tendency to swell when wet give better wearability to any rayon fabric and allow ordinary washing.—Rayonier, Inc., New York 17, N. Y.

**Water Repellent**

Contains no surface active agents; greater repellency than older competitors. (134G)

. . . Arccopel W-18 is improved wax-alumina type water repellent. Emulsion stability due to strong electropositive charge on wax particles. Arccopel is thin white fluid at ordinary temperatures, a reversible gel (melting to a

thin liquid when temperature is raised) at lower temperatures. It's stable for long periods of storage. Generally a 3-6% solution is sufficient.—American Resinous Chemicals Corp., Peabody, Mass.

**Water Repellent**

Shipped as a water-dilutable emulsion for textiles. (134H)

. . . A well-known water repellent finish for synthetics and synthetic blends, De-Cetex 104, is available as a water-dilutable emulsion. Water and catalyst make up solution which is ready for use

and stable for 24 hr. Both emulsion and catalyst are stable for at least 3 months. Treated fabrics are stain resistant, possess desirable hand.—Dow Corning Corp., Midland, Mich.

**Water Repellent**

For wool synthetic fibers; easy to apply. (134I)

. . . Water soluble Quilon (stearato chromic chloride) used for years by paper treaters is now marketed as water repellent for textiles. Quilon-treated glass fiber curtains are washable quick-drying and resistant to water-borne stains. Orlon-wool and Dacron-wool blends have their water-absorption re-

duced by as much as 75% with this treatment. Very little Quilon is needed in treating fabrics. Drying temperatures should be above 212 F., but no additional heat curing is needed.—E. I. du Pont de Nemours & Co., Inc., Grasselli Chemicals Dept., Wilmington 98, Del.

# LITHIUM

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### "Open-Sesame" for Production-Engineering

Lithium presents properties that are stimulating to scientists, researchers and development engineers—properties that open the door to possibilities in countless fields. We can't predict what the future holds for lithium, except to note that it promises to be a bright one. It may pay you to investigate this wonder element. Take a long look at lithium for your production process.

### LITHIUM

- . . . lighter than magnesium or aluminum
- . . . can be cut with a knife
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- . . . chemically reactive
- . . . ductile, easily extruded and rolled
- . . . readily melted or cast

Send for Data Sheets on any of the products mentioned here

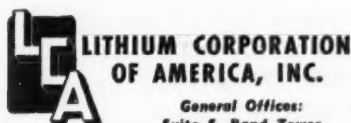
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#### —SALTS—SPECIAL COMPOUNDS

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Metal		Aluminate
Hydride		(Meta) Borate
Amide		Cobaltite
		Manganite
<b>LITHIUM SALTS</b>		Molybdate
Bromide		Silicate
Chloride		Titanate
Carbonate		Zirconate
Sulphate		Zirconium Silicate
Nitrate		
Hydroxide		

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CHEMICAL PLANTS: St. Louis Park, Minnesota • Bessemer City, North Carolina • RESEARCH LABORATORY: St. Louis Park, Minn.

TEXTILE CHEMICALS AND SYNTHETIC FIBERS. . .

**Whiteners**

Optical; act on variety of textiles. (136A)

. . . Two textile whiteners are Safaritone White WNOA and Safaritone White C. WNOA has level dyeing characteristics on wool, nylon, Orlon and acetate. Warm-water-soluble, it re-

quires no separate dyebaths and neutralizing. White C is used for all temperature whitening of cotton bleached or viscose rayon goods.—Hilton-Davis Chemical Co., Cincinnati, Ohio.

• **Miscellaneous Products**

**Air Entraining Agent**

For use in low density concrete and mortar, light weight building products. (136B)

. . . Foamed cement paste made with Mearlcrete P is extremely stable, sets to solid foam without volume shrinkage or increased setting time. Variation in foam cement preparation makes possible a product with density (as low as

12 lb. per cu. ft.), thermal conductivity and compressive strength to suit any need. Used as underground pipe insulation. Reduces costs by creating its own aggregate from air.—Mearl Mfg. Co., New York 14, N. Y.

**Algae, Chlorella**

Potential commercial source of concentrated protein. (136C)

. . . Continuous pilot plant production of Chlorella algae for food is now possible. Arthur D. Little, Inc. has two 160-ft. tubes of polyethylene which enclose aqueous culture of tiny green

plants. Tubing combines light transmission with strength, freedom from toxicity, stability under exposed conditions.—Bakelite Co., New York 16, N. Y.

**Aluminum Fluoride**

For cracking long-chain hydrocarbons. (136D)

. . . Aluminum fluoride with maximum contents of 0.005% chloride, 0.001% sulfate and 0.008% iron should be useful in laboratory cracking

of long-chain hydrocarbons, naphthalene and for the polymerization of olefins.—Fisher Scientific Co., Pittsburgh 19, Pa.

**Aluminum, Porcelainized**

Uses Du Pont developed vitreous frits; opens up new markets for aluminum. (136E)

. . . Porcelain enameled aluminum is impervious to almost all corrosion, can be sawed, drilled or punched with no danger of progressive spalling at the exposed edges. It has excellent impact, flex and thermal shock resistance and is decorative, to boot. Structural applications, both siding and roofing, are most important now, but ultimately home appliances will be biggest market. In chemical field, pipes, fittings, small tanks, heat exchanger shells are best bets. Other potential uses include

architectural tile, marine applications, furniture and lightweight sanitary ware. Since application temperatures for enameled aluminum are lower than those used to apply porcelain to steel, economies in initial cost and operation of furnaces are possible. Low-fusion-temperature vitreous enamel frits—made under Du Pont license—take the principal credit for this new development.—Ferro Corporation, Cleveland, Ohio and Pemco Corporation, Baltimore, Md.

**Antioxidant**

FDA certifies preservative is safe for human consumption. (136F)

. . . Food, drug and allied industries may now use 2, 6-ditertiary butyl-p-cresol, a well known preservative, in their processing. Food and Drug Administration has okayed its use as a food additive. Particularly effective against rancidity in fat-containing foods, the chemical will find use in shortenings,

finished foods. Other uses: protecting certain vitamins from oxidation, stabilizing rubber and plastic compositions. Preservative will cost as little as one cent per hundred lb. of food processed.—Koppers Co., Inc., Pittsburgh 19, Pa.; Shell Chemical Corp., New York 20, N. Y.

**Asphalt Additive**

Improves resilience, impact resistance, ductility, aging qualities. (136G)

. . . Coprecipitation product of barium sulfate (75%) and unvulcanized styrene rubber (25%) improves markedly the resilience, impact resistance, ductility and aging qualities of asphaltic concrete coatings. Product is a finely di-

vided, loose, dry powder with particle size under 5 microns. Additive and asphalt are mixed in the proportion of 88% asphalt and 12% additive, or 3% rubber.—Rubarite, Inc., Magnet Cove, Ark.

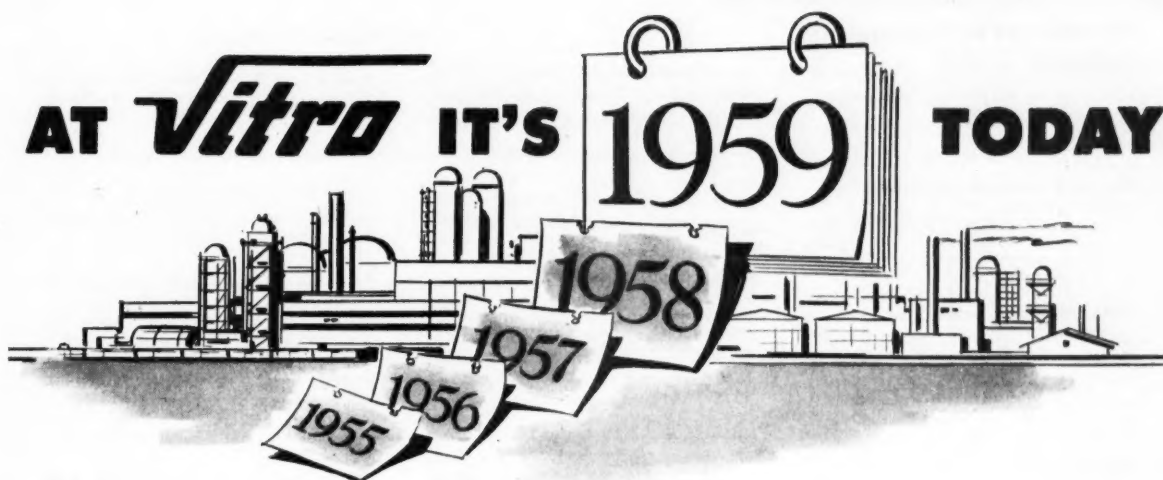
**Battery, Nickel-Cadmium**

Lasts 5 times as long as lead batteries; operates at extremely low temperatures. (136H)

. . . After four years use by U. S. armed forces, nickel-cadmium batteries are available to civilians. Two biggest advantages are long life, 10 to 20 years, and wide operating temperature range, —65 to 165 F. Battery uses KOH, which freezes at about —75 F., as elec-

trolyte instead of acid. Auto units now need only be one-third usual size. Cells can be left in complete discharge, are not damaged by excessively high rates of discharge or charge, overcharge or even reverse charging.—Sonotone Corp., Elmsford, N. Y.





**I**t's not enough to keep up with the times. Your success today depends upon keeping ahead of competition.

*At VITRO the desk calendars may read 1954, but the mental calendars are turned to 1959*

By consistently looking ahead VITRO utilizes the most advanced science and technology to anticipate the problems that industry will face in the future.



VITRO's major engineering accomplishments have all been well in advance of their time:

- the country's largest titanium facilities

- original uranium gaseous diffusion plants
- extensive plutonium production facilities
- biological laboratories for the government
- two large plants for nerve gas production
- armament evaluation facilities for the Air Force
- many other intricate processing facilities for industry and government



VITRO's eye-to-the-future is effective in many fields of the Atomic Age — metallurgy, nucleonics, chemistry, electronics, refining and processing — all vital to the industrial requirements of the years ahead.

***VITRO makes tomorrow's technology available today!***

**Vitro**

**CORPORATION of AMERICA**  
261 Madison Avenue, New York 16, New York

### **DIVISIONS**

- VITRO MANUFACTURING COMPANY** makes ceramic colors and pigments and related chemical products
- VITRO URANIUM COMPANY** processes uranium ores on the Colorado Plateau for the Atomic Energy Commission
- VITRO RARE METALS COMPANY** refines and recovers rare metals and processes uranium materials
- VITRO LABORATORIES** conducts chemical and physical research and develops processes and systems
- VITRO ENGINEERING DIVISION** designs and engineers processing and technical facilities and manages construction

## MISCELLANEOUS PRODUCTS ...

**Beryllium Flakes**

99.5% pure. (138A)

... Metallic beryllium flakes (99.5% pure) are now commercially available. Their high ductility makes them suit-

able for fabricating beryllium by hot pressing.—*The Beryllium Corp., Reading, Pa.*

**Blood Pressure Depressant**

Acts quickly, yet subsides quickly. (138B)

... Arfonad, blood pressure depressant, permits surgeons almost complete control of bleeding in difficult head,

neck and chest operations. It acts quickly, subsides rapidly.—*Hoffmann La Roche, Inc.—Nutley, N. J.*

**Chlorine-Liberating Compound**

For use where safe controlled release is important. (138C)

... Halane is used where ordinary active chlorine compounds are unstable or unable to perform under specified conditions. Product is dichloro dimethyl hydantoin, contains at least

66% by wt. of available chlorine. Possible uses: shrinkproofing wool, sterilizing paper and pulp against microbiological attack.—*Wyandotte Chemical Corp., Wyandotte, Mich.*

**Filter Aid**

Made from anthracite coal. (138D)

... AnthraAid can be used in almost any operation in which suspended solids must be removed. Two main advantages: composition—mainly carbon

that's insoluble in alkalis—and good geographic locations—close to big Eastern markets.—*Anthracite Equipment Corp., Wilkes-Barre, Pa.*

**Filter Aid**

Advantages over diatomaceous silica; carload lots available. (138E)

... Nerofil is a carbon filteraid which, unlike diatomaceous silica, is completely resistant to alkaline solutions. But it provides same high porosity and perme-

ability offered by silica. Filter cake is combustible, easing waste disposal problems.—*Great Lakes Carbon Corp., Morton Groves, Ill.*

**Filter Aid**

Made from wood cellulose; contributes no contamination, even at temperatures above 350 F. (138F)

... Solka-Floc, a finely divided wood cellulose filteraid, can frequently give combinations of high flowrate and sharp clarity not otherwise possible. Floc is being used to filter alkalis, acid plating baths, metallurgical slurries, syrups and vegetable oils containing solids valuable as animal feeds. Being nearly 100% pure cellulose, it produces no silica contamination and negligible inorganic contamination of any kind, is essentially ashless. Cellulose is resistant to alkali attack at all concentrations and at temperatures to 120 F. Solka-Floc's colloidal character can be effective as an absorbent for undesirable impurities. It's strongly electro-negative in water, tends to absorb positively charged particles, is used to remove iron from caustic solutions and emulsified oil from water. Filteraid is nonabrasive to pumps, valves, filter screens, cake handling equipment. Solka-Floc contains low percentage of voids, holds up less liquid than competing products, gives drier filter cake.—*Brown Co., Berlin, N. H.*

**Foam, Isocyanate**

2 lb. per cu. ft. (138G)

... Urefoam is foamed-in-place isocyanate foam. It's supplied in two components which are mixed to form foams

with densities as low as 2 lb. per cu. ft.—*Atlas Mineral Products Co., Mertz town, Pa.*

**Inhibitor**

Permits packaging of quaternary ammonium compounds in metal containers for first time. (138H)

... Use of QAI (2-hydroxypropylamine nitrite) allows you to put products containing quaternary ammonium compounds into all-metal containers. Only 0.05-0.5% of QAI is required to inhibit corrosive properties of these compounds widely used in manufacture of cationic disinfectants. Inhibitor, fully

soluble in water-base materials is equally effective in liquid soaps, phenolic and pine disinfectants, emulsion floor waxes and water base compounds with pH's above 8.0. Thus, manufacturers of corrosive materials can reduce packaging and shipping costs.—*R. M. Hollingshead Corp., Camden, N. J.*

**Ink, Skid-Resistant**

Eases shipping. (139A)

... Hydry Non-Skid Ink minimizes sliding, shifting and extra handling of bags, cartons, etc., solves shipping prob-

lems of manufacturers and users of industrial packages.—*Sun Chemical Corp., Long Island City, N. Y.*

**Inks, Indelible Colored**

Withstand process rigors. (139B)

... Indelible colored inks, believed to be the first to withstand solutions and temperatures of modern processes, are designed for identifying fabrics, paper,

metals and plastics in any industrial process where colors must survive water, steam, solvents, bleaches, alkalis.—*Driflo Mfg. Co., Hazel Park, Mich.*

**Insulator, Underground**

Provides permanent, triple-zone corrosion protection for hot pipe installations. (139C)

... Gilsulate is easy-to-install insulating material for hot underground pipes. It's a blend of specially sized and selected gilsonite, a highly resinous asphaltite used in floor tile, paint and battery boxes. Gilsulate forms three protective layers to assure permanent protection against alkaline ground waters, electrolysis, root attacks and bacterial attack. When Gilsulate is poured on hot pipe one layer melts and fuses to pipe. Second layer is com-

posed of sintered particles, the third of unconsolidated material. First two layers are waterproof, provide thermal and electrical insulation, allow pipe to expand and contract easily. The third layer gives further thermal insulation and high load-carrying capacity. Gilsulate doesn't require sleeves to protect insulation. Heat loss from insulated pipe is 8-11% of that from bare, buried pipe.—*American Gilsonite Co., Salt Lake City, Utah.*

**Magnesia, Water Proof**

For underground piping, process equipment. (139D)

... Form of 85% magnesia insulation is highly resistant to severe moisture conditions. Immersion—in boiling water—of hot insulated steam piping for 378 hrs. with intermittent drying

out, has no effect on magnesia's insulating properties; only effect is slight surface roughening.—*Magnesia Insulation Manufacturers Association, Washington 4, D. C.*

**Metal Treatment**

Phosphate cleaner-coater eliminates elaborate cleaning equipment for heavy parts. (139E)

... Well adapted to metallic equipment too big for standard phosphate treatment, the Detrex 800 series of phosphoric acid-type preparations can be applied by brush, sponge, dip and flow-on. Functions are two fold: as

cleaners they remove rust, light scale, shop dirt; as coating agents they react with ferrous metals to form fine-grained, crazed surface of iron phosphate into which paint flows and is bonded.—*Detrex Corp., Detroit 32, Mich.*

**Molybdenum Disilicide**

Resists oxygen; doesn't burn. (139F)

... Molybdenum disilicide can be used at temperatures up to 3,000 F. without using a vacuum, whereas silicon carbide is good only up to 2,400 F. and pure molybdenum wire, while good to

3,600 F., requires a vacuum. First use for molybdenum disilicide will be as heating element for making glass and ceramics.—*American Electro Metal Corp., Yonkers, N. Y.*

## Looking for Something?

Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and tech-

nology, new chemicals and materials, new equipment and accessories and technical literature now available. Use The Reader Service postcards for more information—fast—on products and services.

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## MISCELLANEOUS PRODUCTS...

### Oxidizing Agent

New source of HOCl gives nearly stoichiometric oxygen transfer. (140A)

... Clorpactin, a germicide and disinfectant, has some potential as an industrial oxidizing and chlorinating agent. This highly buffered derivative of hypochlorous acid and an organic radical may be used in textile stripping and bleaching, chlorination of rubber, oxidation of paraffin waxes to aldehydes

and acids. Though higher priced than CaOCl and NaOCl (it costs 50¢ per lb.) its rapid, nearly quantitative transfer of oxygen may make it competitive. Product, available in 30 grades of varying strength, permits processor to choose reaction rate. — *Guardian Chemical Corp.*, Long Island City, N. Y.

### Palm Oil Substitute

For steel processing. (140B)

... Specially prepared beef tallow can be substituted for palm oil used as a lubricant for cold-rolling sheet and strip steel and as an aid in hot dipped tin-

ning of such steel. Substitute insures against possible dislocation of palm oil imports.—*American Iron and Steel Institute*, New York 1, N. Y.

### Penicillin

Designed to eliminate allergic reactions to standard form. (140C)

... Penicillin O is specifically designed to overcome allergic reactions to the standard form, type G. Type O, allylmercaptomethyl penicillin, has bacteri-killing ability equal to that of type G

and eliminates reactions such as skin eruptions, abscesses, fever, etc., incurred with standard type. Its trade name is Cer-O-Cillin.—*The Upjohn Co.*, Kalamazoo, Mich.

### Penicillin, Liquid Suspension

Has 2-3 year shelf life. (140D)

... K-Cillin (Bio-Ramo Drug Co.) and Clilloral Suspension (Bristol Laboratories) are stable liquid suspensions of penicillin's soluble salts, have shelf

lives of 2-3 years without refrigeration.—*Bio-Ramo Drug Co.*, Baltimore, Md. and *Bristol Laboratories, Inc.*, Syracuse, N. Y.

### Preservatives

Protect against fungal attack on house exteriors, paper and even rope. (140E)

... Two new fungicidal agents kill and prevent growth of causative organisms. Rosin Amine D pentachlorophenate is chemically inert and non-toxic to warm blooded animals. It's used as a fungicide in paper for soap

wrappings, as a preservative for cottons. Rosin Amine D acetate is particularly useful in special textiles where its lack of color, its strengthening effect or its adhesiveness are desirable.—*Hercules Powder Co.*, Wilmington, Del.

### Radioisotopes

Sold "over the counter" by mail. (140F)

... Safe, low-cost radioisotopes are bottled and sold by mail order. No AEC authorization, formal training at Oak Ridge and elaborate safety precautions are needed. Previously only large

radiations — millicuries — could be bought, but now all 25 compounds offered can be obtained in microcuries — a thousandth of a millicurie.—*Fisher Scientific Co.*, Pittsburgh 19, Pa.

### Refractory, Silicon Carbide

Transfers heat 11 times faster than conventional fireclays. (140G)

... Exceptional thermal conductivity makes new refractory, Carbofrax, suitable for indirect heating, heat exchange and heat dissipation equipment. Can be used above 3,000 F.—comparable to

chrome-nickel steel at high temperatures. Available in bricks, cement and special forms for recuperators, radiant tubes, and furnaces. — *Carborundum Co.*, Niagara Falls, N. Y.

### Refrigerant

Nonflammable, nonexplosive. (140H)

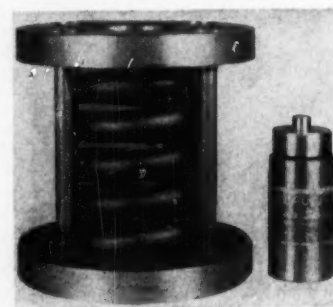
... Freon 13 (monochlorotrifluoromethane), a nonflammable, nonexplosive refrigerant for -70 to -150 F., is finding wider usage in metal treatment

and chemical processes. It's adaptable to compact hermetic-type compressors.—*E. I. du Pont de Nemours & Co., Inc.*, Wilmington 98, Del.

### Silicone Fluids

Feature higher, more stable viscosities, greater resistance to mechanical shear. (140I)

... Viscasil Fluids have viscosities of 1,000 to 100,000 centistokes. These silicone fluids possess properties—shear resistance, viscosity stability, heat stability—superior to those of other fluids of similar viscosity. Advantages are evident in damping applications: fluid couplings, torsional vibration dampers, time delay relays. As the major component of the compoil fluid of a Wales-Strippert preloaded Hydra Spring, Vicasil silicones help provide identical characteristics to those of big caged railroad-type spring.—*General Electric Co.*, Pittsfield, Mass.





## FAMOUS LIGHTHOUSES OF AMERICA



*Boston Light, America's first lighthouse, was built in 1716 at the north side of the entrance to the main ship channel in Boston Harbor. The scene of several bitter contests for possession during the Revolutionary War, it was destroyed by the British in 1776. A new tower for this famous light was built in 1783 and is still in use today.*

**Guiding Light** to users of electrochemicals is the integrity of Niagara Alkali Company, for over fifty years a pioneer in the development and production of these important materials. You can rely on Niagara for quality in...  
Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash,  
Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene,  
Niagathal® (Tetrachloro Phthalic Anhydride)

### **NIAGARA ALKALI COMPANY**

60 East 42nd Street, New York 17, N. Y.

*For Inquiry Code Numbers, see Master Index on Page 6*

## MISCELLANEOUS PRODUCTS . . .

**Silicone Fluid**

Makes skin cream water repellent. (142A)

. . . A water-white, odorless compound, DC 555 silicone fluid is readily diluted with such substances as lanolin, beeswax, mineral oil and 95% ethanol. It's

an easily blended, nonseparating ingredient for cosmetic preparations and ointments.—Dow Corning Corp., Midland, Mich.

**Tetracycline**

Three companies make antibiotic by two processes. (142B)

. . . Working independently, Lederle Laboratories and Chas. Pfizer & Co. have isolated a broad-spectrum antibiotic, tetracycline. Both use a process which replaces the chlorine in chlorotetracycline (Aureomycin) with hydrogen, using a palladium catalyst. Almost simultaneously, Heyden Chemical an-

nounced they can prepare the drug by fermentation. Test-tube activity of tetracycline parallels that of both Terramycin and Aureomycin, has fewer, less severe side effects.—Lederle Laboratories, Pearl River, N. Y., Chas Pfizer & Co., Brooklyn, N. Y. and Heyden Chemical Corp., New York, N. Y.

**Wax, Vegetable**

Has greater abrasion resistance and stability. (142C)

. . . Refined Carnauba-like vegetable wax, Durango-Wax, is obtained from double-refined candelilla wax by extracting those resins which previously have been drawbacks in manufacture of

carbon paper and polishes. Abrasion resistance is thus improved, and products manufactured from wax are more stable. —Candelilla Industrializada, Durango, Mexico.

**Waste Calcium Carbonate**

Transformed into valuable products by simple processing. (142D)

. . . Freshly produced or protected calcium carbonate waste deposits can be profitably disposed of by drying, calcining or hydrating CaO. A simple drying operation produces salable CaO, competing with commercial whiting selling for from \$6 to \$40 a ton. Drying at 500 F. yields a product equivalent to commercial precipitated chalk used for filler in rubber and paint and as agri-

cultural lime. Lime grade will bring \$9 a ton; purer material, if ground, can sell for \$13 a ton (putty), \$30 a ton (rubber), \$40 a ton (paint filler). Burning temperature of 1,500 F. gives CaO competitive with material selling at \$9 a ton. Hydrated lime could sell as building material grade at \$10 a ton. —General Industries, Inc., Philadelphia, Pa.

**Water Reagent**

Detects traces. (142E)

. . . Moistec can be applied to anhydrous solvents, paint thinner, higher alcohols, vegetable oils. No heating re-

quired since reagent is just dropped into sample.—R. P. Carnegie Laboratories, New York 6, N. Y.

**Zirconium Chemicals**

Big markets in catalysts, metal refining, textiles, pharmaceuticals, leathers. (142F)

. . . Growth of zirconium chemicals industry—annual sales rate now at 40,000 tons—opens up markets for use of compounds. One recent development is role of zirconium compounds—ZrO<sub>2</sub> and salts—as catalysts or catalyst support in variety of reactions. These include ammonia synthesis via nitrogen and hydrogen and esterification of ethyl alcohol with HCl. Hydrous zirconium dioxide is used to cure dermatitis resulting from poison ivy. In textile field, zirconyl salts, zirconylic acids, alkaline and complex salts of zirconium are used as water repellents and dye fixatives. In combination with alkali chlorides, zirconium tetrachloride and tetrafluoride are widely used as additives to molten magnesium metal. Zirconium dioxide—over 95% pure—acts as an opacifier in antimony and zirconia opacified sheet steel enamels, is also used in fabrication of refractory wares. Zirconium sands are used in foundries for cores, molds, facings. Hydrous zirconia is a powerful adsorbent for metallic and non-metallic contaminants, color contaminants and odors. Zirconium and its compounds are also good for leather tanning, pigments and driers, and are precipitants for nearly all classes of acid and basic dyes.—Titanium Alloy Mfg. Div. of National Lead, New York 6, N. Y.





**it pays to see VICTOR**



## OXALIC ACID

Oxalic acid is a brilliant, transparent, colorless, crystalline material.

**USES:** Radiator cleaning compounds. Leather processing. Bleaching of straw, wood and cotton linters. Laundry sour for discharging bleach and removing iron stains. Washing coal. Removing rust stains from marble. Manufacture of metal polishes, blueprints, dyes, bluing. Purifying compound and precipitating agent. Analytical reagent. Reclaiming colored candles. Ink and rust remover. Purifying resin. Cleaning railroad cars.



## Remedy for Rusty Pipes

In automobile radiators, steel, hot water and air combine to produce rust and scale. Both are undesirable . . . particularly when they interfere with the cooling function of an automobile radiator. Nothing equals the ability of oxalic acid in keeping radiators clean and rust-free. Victor oxalic acid is one of the principal components of most nationally-known brands of auto radiator cleaners. It pays to see Victor.

## SODIUM TRIPOLYPHOSPHATE

Sodium tripolyphosphate anhydrous, powdered or granular.

**USES:** Soap builder. Manufacture of detergents and water softeners. Purification of china clay. Conditioning oil drilling muds. Particularly effective in bar soaps; will not crystallize nor bloom. Disperses soap curds in hard water and eliminates scum. Clay dispersant. Deflocculant in raw cement slurries. Anti-pitch agent in paper making.



## Wild Pitch Causes Loss

Paper making is a multi-million dollar industry in which phosphates play an important role. For example . . . Victor sodium tripolyphosphate and tetrasodium polyphosphate are used to remove wood tar or "pitch" from raw pulp that would cause "downgrading" if it were not taken out. In addition, Victor sodium phosphates are used to control water hardness. This prevents clogging of equipment and permits a better blending of water with pulp. Send for Technical Service Bulletin V1-52. It pays to see Victor.

## DISODIUM PHOSPHATE, ANHYDROUS

Anhydrous disodium phosphate is a white, crystalline material of food grade purity. Also available, disodium phosphate duohydrate, a white, crystalline material which complies with Food and Drug Laws in purity.

**USES:** Boiler water treatment. Tin weighting of milk. Textile process waters. Buffer in dye-baths. Casein emulsifier. Processing of cheese. Manufacture of pharmaceuticals, and evaporated milk. Pumping pickle for canned meats.



## Plug for Wisconsin

Children love it for lunch. Melted, it makes a tasty sandwich. Blended, it makes a splendid sauce. *It's delicious process cheese.* To give process cheese its smooth, creamy texture, cheesemakers call for Victor's disodium phosphate. Without it, process cheese would be crumbly and unappetizing in appearance. With it, process cheese sales have had a steady, healthy growth. It pays to see Victor.



## FORMIC ACID

Formic acid is a fuming, colorless, corrosive liquid that evaporates completely on exposure to the air. It has a characteristic pungent, penetrating odor, and is milder than muriatic or sulphuric acid; considerably more active than acetic acid.

**USES:** Tanning. Acidifying dye-baths. Souring in laundries. Plating baths. Manufacturing formates, fumigants, insecticides, pharmaceuticals, antibiotics, refrigerants, solvents for perfumes, and lacquers. Wire stripping compounds.



## Never Underestimate the Power of a Woman

By and large, men dye for women. The constant search for new colors and shades rests largely on the female fashion whim. Finding color variations is relatively simple. Matching these shades in various textiles and weaves is another story. Victor formic acid, diammonium phosphate, and other phosphates help dyers do their job faster, more accurately and with a minimum of risk. New applications for the textile industry are in the process of development. Write for details.

## SURFACE-ACTIVE PHOSPHORUS COMPOUNDS

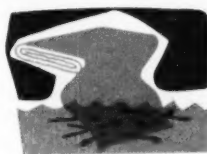
**Victawet® 35B.** Anionic. 70% paste. Soluble in water. Sparingly soluble in alcohol. Non-foaming.

**Victawet® 58B.** Anionic. 70% paste. Soluble in water. Sparingly soluble in alcohol. Used where clear water solution and small amounts of foam are desirable.

**Victawet® 12.** Non-ionic. 100% active liquid. Soluble in alcohols. Insoluble in naphtha. Milky solution in water. Non-foaming.

**Victamines C & D.**

(U. S. Pat. 2406423) Cationic. 100% active. Disperses in water. Soluble in alcohols, ether, kerosene, toluene.



## Wetter Water Works Wonders

Reducing the surface tension of water increases the ability to penetrate, spread or "soak." In metal cleaning, for example, the use of a Victor wetting agent in the cleaning solution assures a more rapid, more thorough coverage of the surface to be cleaned. Faster cleaning and better cleaning often results. Many industries such as the textile, paper, detergent, laundry and chemical industries have found profitable use of such Victor wetting agents as Victawet 35B, 58B, 12 or Victamines C and D. It pays to see Victor.

## ALUMINUM FORMATE

Aluminum formate, basic (solution), U. S. Pat. 2154170, is a colorless solution containing 8.5% aluminum oxide ( $Al_2O_3$ ), and mildly acid in reaction.

Specific gravity of 1.15-1.19 Baumé

**USES:** Waterproofing. Mordanting. Anti-perspirant compounds.

## Solution for Stormy Weather

Ever wonder why a trench coat stays dry inside when it's raining "cats and dogs" outside? Victor aluminum formate provides part of the answer. Combined with waxes and other ingredients, aluminum formate makes a water-repellent coating for textiles and paper.

**VICTOR**  
Dependable Name in  
*Chemicals*  
for 56 Years

## PHOSPHORIC ACID

Phosphoric acid is a clear, colorless, sparkling liquid. All grades meet the requirements of the Federal and State Pure Food Laws.

Concentrations: 75%, 80%, 85% N.F.  
115% (Polyphosphoric)

**USES:** Manufacture of yeast, sugar, soft drinks, imitation jelly, gelatin, and pharmaceuticals. Rustproofing, engraving, railroad car cleaning, refining oil and gasoline, preserving silage. Weighting silk, and dyeing textiles. Chemical polishing and electro-polishing metals, bright-dip baths for aluminum. Manufacture of phosphates, dental cements, glue, ceramics, glass, metal treating compounds, explosives, and fertilizers.



## Start of a Beautiful Finish

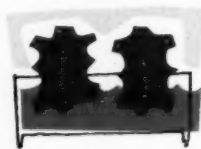
Victor phosphoric acid is giving many companies a brighter look on profits. Chemical or electro-polishing baths containing phosphoric acid are replacing mechanical buffing for the finishing of products made of stainless steel, aluminum and other metals which can be given a bright, shiny finish (inside and out) in a few minutes. Here is another example of how Victor helps industry find faster, lower cost or better production methods. It pays to see Victor.

## SODIUM FORMATE

**TRADE MARK — Protan®**

Protan® sodium formate is a white, odorless powder, soluble in water.

**USES:** Chrome tanning. Neutralization of leather. Wallpaper printing. Plating baths. Reducing agent. Blueprint developers. Neutralizer for carbonized wool.



## Tanning Takes Time

Speeding tanning time interests every leather tanner. Victor sodium formate helps turn the trick. When sodium formate is added to chrome tanning solutions, the chrome liquors are stabilized, and rapid, uniform penetration of the leather takes place. Fixation is increased and more chrome is exhausted from the solution. In addition to other advantages, leather is produced with greater smoothness and fullness. Sodium formate is the most effective of the chrome tanning masking agents. Further proof that it pays to see Victor.

plants and offices of VICTOR CHEMICALS



it pays to see

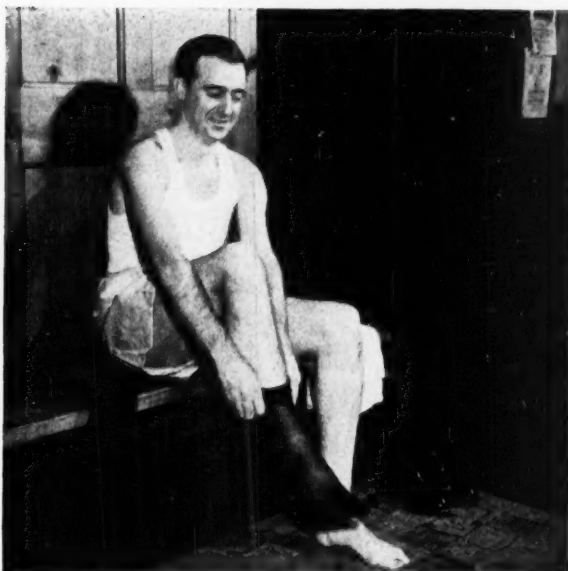
**VICTOR**

Dependable Name in  
*Chemicals*  
for 56 Years

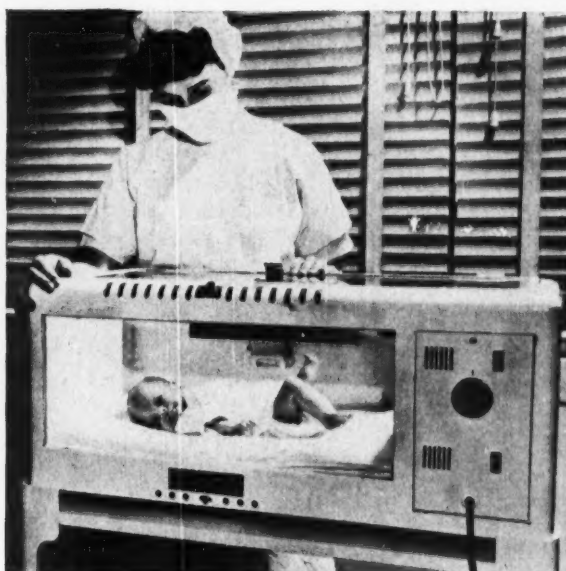
**VICTOR CHEMICAL WORKS**

141 West Jackson Boulevard  
Chicago 4, Illinois

# How would YOU solve these two problems?



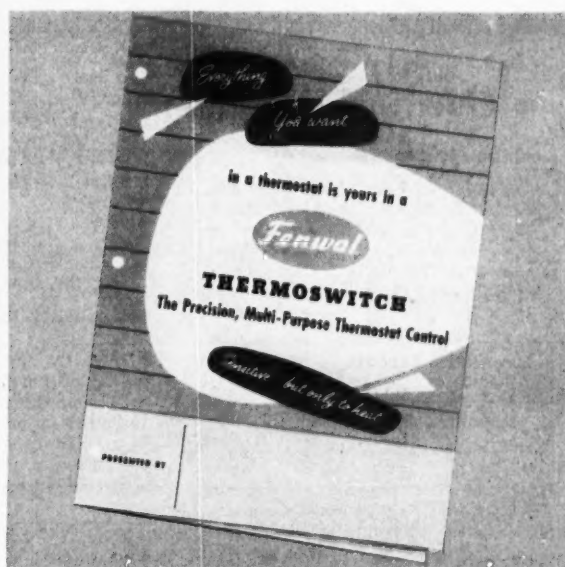
**1. MEN AND WOMEN BOTH** like nylon fabrics. Important key to producing successful nylon fabrics is the heat-setting process. Temperature-control must be accurate, and reliable yet readily adjustable. "National" Nylon Heat Setting Machines used by the leading textile mills employ THERMOSWITCH® units in the heated rollers... get highest efficiency... greatest safety... most economical fuel consumption.



**2. BABY INCUBATOR MUST BE SAFE.** Engineers who design Armstrong Baby Incubators say "Safety is a *must* where babies are concerned. That is why all our baby incubators are tested and approved by Underwriters Laboratories. That is why we use only Fenwal THERMOSWITCH units to control all-important temperature and humidity. Inspection reports on more than 22,000 THERMOSWITCH units show a remarkable picture of consistent reliability."



**3. THIS IS IT** — the Fenwal THERMOSWITCH control is simple — compact shell contracts or expands *instantly* with temperature changes, opening or closing electrical contacts. Adjustable and highly resistant to shock and vibration. Fenwal THERMOSWITCH units are solving temperature problems and helping to improve the final product throughout all industry.



**4. SEND FOR THIS BROCHURE** for complete explanation of the unique THERMOSWITCH unit. Also ask for more detailed, illustrated discussions of the problems above. Fenwal engineers will be glad to help you solve your temperature control problems involving heat, humidity, radiant heat, pressure and other variables. Write Fenwal Incorporated, 169 Pleasant St., Ashland, Massachusetts.



**THERMOSWITCH®**

Electric Temperature Control and Detection Devices

**SENSITIVE... but only to heat**



**Equipment . . . .****Plants . . . . . 44****Processes . . . . 66****Chemicals . . . 94****Literature . . . 256****This Section . . .**

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## Inventory of New Equipment and Accessories:

. . . A comprehensive description, organized for fast reference, of 571 major new U. S. equipment developments during the past year.

### • Electrical Equipment

**Battery, Storage**

Takes charge in 30 min.  
(148A)

. . . Heavy-duty battery takes full charge repeatedly without damage in a matter of minutes. Voltage is 10% higher and remains high throughout 90% of operating discharge. More watt hours are obtained than with other batteries having the same ampere-hour rating.

Secret of performance is use of lead-hydrate plates that feel like sponge, yet will not shed, buckle, expand, sulfate or deteriorate. Batteries are priced competitively and guaranteed for 6 years.—X-L-Ko Mfg. Co., North Vancouver, B. C.

**Breaker, Circuit**

Compact; has quick-make, quick-break mechanism.  
(148B)

. . . More compact design without sacrifice of protective features is offered in J-frame 225-amp. circuit breaker. Units is 9 in. wide by 11 in. long and 5½ in. deep, including handle. Reduced size allows double-butt mounting in convertible panel boards. Breaker is

thermal magnetic type. Common trip operation is retained. Unit is available in ratings from 70 to 225 amp.; two- and three-pole; 600-v., a.c., 200-v., d.c.; 15,000 amp. interrupting capacity.—I-T-E Circuit Breaker Co., Philadelphia, Pa.

**Center, Control**

Aluminum, lighter than steel or copper. (148C)

. . . All-aluminum control center gives increased corrosion resistance for chemical industry application. Design incorporates economical use of space,

economy of installation, reduction of work hazards, efficient control supervision.—Westinghouse Electric Corp., Pittsburgh 30, Pa.

**Conductor, Flexible Metal**

Water-cooled, can pre-heat and anneal pipe welds.  
(148D)

. . . Flexible hollow all-metal conductor (½-in. I.D.) used for induction heating of pipe welds eliminates weld failure due to internal stress. It can preheat and anneal high tensile strength, chrome, and carbon-molybdenum steel, or stainless steel alloys. Conductor has

brass inner core—serving as water passage—and braided copper jacket carrying current. Cooling water flows at rate of 3 gpm. Electric current-carrying capacity is approximately 1,000 amp.; sufficient for heating over 1,400 F.—Titeflex, Inc., Newark 5, N. J.



## What It Contains . . .

This is CE's first annual inventory of current technical literature available from manufacturers. This section contains 2,238 listings and is by far the most comprehensive inventory of its kind available to chemical engineers. It covers the fields of chemicals, raw materials, equipment and accessories, processes and services. The section includes all literature items mentioned in the monthly Technical Literature department of Chemical Engineering from November 1953 through July 1954 as well as all literature mentioned in the ads in this Inventory Issue.

## For More Information...

You can get — and get fast — more information on any item in this Inventory of Technical Literature by using the Reader Service postcards beginning on p. 35. Simply write in the item's code number on one of the cards, fill in your name and address, then mail to us. Answers will come to you direct from the manufacturer. Use the cards as often as you please during the coming year to build up and keep current your technical files. This annual inventory of current technical literature (with 2,238 listings in this issue alone) is a feature exclusive to this publication.

### Drive, Variable Speed

Precise speed through electronic control. (149A)

. . . The stepless, adjustable-speed, Select-A-Spede drive gives highly precise speed regulation. Unit operates from a.c. power lines to drive standard d.c. motors,  $\frac{1}{4}$  to 15 hp. When used with optional tachometer feedback equipment, regulation will be  $\pm \frac{1}{2}\%$ .

Drive is built with speed ranges of 5:1, 20:1, 50:1 and 100:1 for some applications. Optional features include inching, jogging, threading speeds, control acceleration and deceleration, dynamic braking and reversing.—Louis Allis Co., Milwaukee 7, Wis.

### Electrode, Welding

High ratio in. of welding to rod used. (149B)

. . . Welding electrode for general use constructed of mild steel, assures high ratio of inches of welding to inches of electrode used. Electrode, Type

W-610-A, is d.c. reverse polarity rod. Facilitates welding in all positions.—General Electric Co., Schenectady 5, N. Y.

### Floodlight, Portable

Approved for hazardous areas. (149C)

. . . Explosion-proof portable floodlight assures 100% safety in lighting all hazardous areas. It's the only portable floodlight approved by Underwriters' Laboratories for such widespread use, and the only one permitted for use in hydrogen, acetylene and manufactured-

gas areas. Interior of lamp is pressurized to prevent entry of gas. If internal pressure drops below  $3\frac{1}{2}$  psi. a micro switch extinguishes the lamp. Lamp is fabricated of reinforced Formica.—Safe Lighting Inc., Jackson Heights, N. Y.

### Gearmotor, Integral

1 to 15 hp. (149D)

. . . Gearmotor line is available in wide range of speeds with single, double, or triple gear reductions. To fit a broad

extent of varying load requirements, gears meet AGMA specifications.—Century Electric Co., St. Louis 5, Mo.

### Lighting, Fluorescent

Explosion-proof. (149E)

. . . Fluorescent lighting is explosion-proof and dust-tight for hazardous locations. Each fluorescent tube is housed individually in heat-resisting glass. Tube

ends are reverse tapered and sealed into aluminum housings, which also contain receptacles. Relamping is simple.—Crouse-Hinds Co., Syracuse, N. Y.

### Lamp, Trouble

Explosion-proof, for oil drum inspection. (149F)

. . . Portable trouble lamp can be used at hazardous locations where explosive gases or vapors exist. It's useful for inspecting interiors of gasoline drums or process vessels, illuminating inaccessible gages. Light from lamp is similar

to powerful flashlight beam; is supplied by 12-v. auto lamp. Lamp housing can withstand more than 4x conceivable pressure from an explosion within the housing.—Crouse-Hinds Co., Syracuse, N. Y.

### Motor, Chemical

Protected. (149G)

. . . Chemical motors produced experimentally using 100% epoxide resin as protective varnish. Varnishes have high

corrosion resistance. Hardened coating stands up at maximum of 250 C.—The Louis Allis Co., Milwaukee 7, Wis.

## ELECTRICAL EQUIPMENT . . .

**Motors, Electrical**

Small, powerful, effective ventilation, modern styling. (150A)

. . . In accordance with new NEMA frame size standards, LA line of electric motors offered in open drip-proof, totally-enclosed fan-cooled and explosion-proof enclosures. Ratings up to 40 hp. at 3,600 rpm. Features of line include modern styling, improved ventilation, greater protection, new con-

duit box arrangement, new bearing construction and more versatile mounting. Name plate design includes bearing sizes, service factor and NEMA design type in addition to data carried on former name plates. Also, it resists obliteration.—The Louis Allis Co., Milwaukee 7, Wis.

**Motors, Electric**

New look under new code. (150B)

. . . New motors introduced by three manufacturers are designed in accordance with new NEMA code. Smith line is offered in either old or new mountings. Contour lines and styling the same as old design. Drip-proof model is well ventilated.—A. O. Smith Corp., Milwaukee 1, Wis.

. . . Reliance motors offer better protection of motor windings, leads and

bearings. New open design is highly protected. TEFC design runs in any position.—Reliance Electric & Engineering Co., Cleveland 10, Ohio.

. . . Westinghouse design offers longer insulation life, good ventilation and better drip protection; better bearing seals and TEFC pressure-equalizer bypass to guard bearings.—Westinghouse Electric Corp., Pittsburgh 30, Pa.

**Motor, Electric**

Undamaged by abrasive atmosphere. (150C)

. . . Developed to withstand atmospheric suspensions of taconite dusts, electric motor design may help answer motor operating problems in other abrasive atmospheres. Taconite dust, extremely abrasive and magnetic, nor-

mally takes 8 hours to settle in draft-free room and is difficult to keep out of bearings. Motor design licks this problem by using a rotating slinger on motor shaft to keep out dust.—The Louis Allis Co., Milwaukee 7, Wis.

**Motor, Electric**

New in all respects. (150D)

. . . Tri-Clad 55 electric motor, new from top to bottom, is built in accordance with revised NEMA frame dimension standards. Average size reduction is 50% by volume; average weight reduction per hp. is 22%. Distinctive

features are lower operating noise level, new insulation system, new bearing assembly and new ventilation plan. Cast-iron frame and end shields give greater rigidity.—General Electric Co., Schenectady 5, N. Y.

**Motor, Enclosed D.C.**

Cooled, ratings from 15 to 200 hp. (150E)

. . . Totally enclosed, unit-cooled d.c. motor withstands severe atmospheres. Motor features 50% greater heat transfer in unit 37% smaller than previous

designs. Double system of blowers assures rapid cooling. Ventilation is independent of motor speed.—General Electric Co., Schenectady 5, N. Y.

**Motors, Gear**

Wide selection, includes motor types and enclosures. (150F)

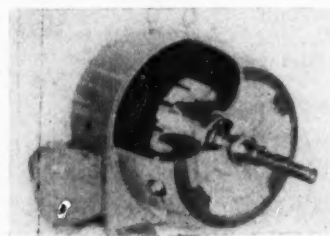
. . . Line of gear motors offers wide selection of compact integral power units. Frame sizes range from 1 to 150 hp. with choice of single, double or triple speed reduction. Among design features are positive oil seal be-

tween gears and high-speed bearing, large oil reservoir for efficient splash lubrication of gears, extra-capacity anti-friction bearings, locked motor-shaft pinion.—Elliott Co., Crockers-Wheeler Div., Ampere, N. J.

**Motor, Pump**

Can be close coupled, ratings as high as 60 hp. (150G)

. . . Close-coupled pump motors are available in ratings as high as 60 hp. Motors designed specifically for use with centrifugal pumps. Shaft alignment or pump mounting problems are eliminated by supporting pump on its NEMA Style C registered mounting bracket. Type SCB motor can be mounted in any position.—U. S. Electrical Motors, Inc., Los Angeles 54, Calif.

**Motors, Standards for**

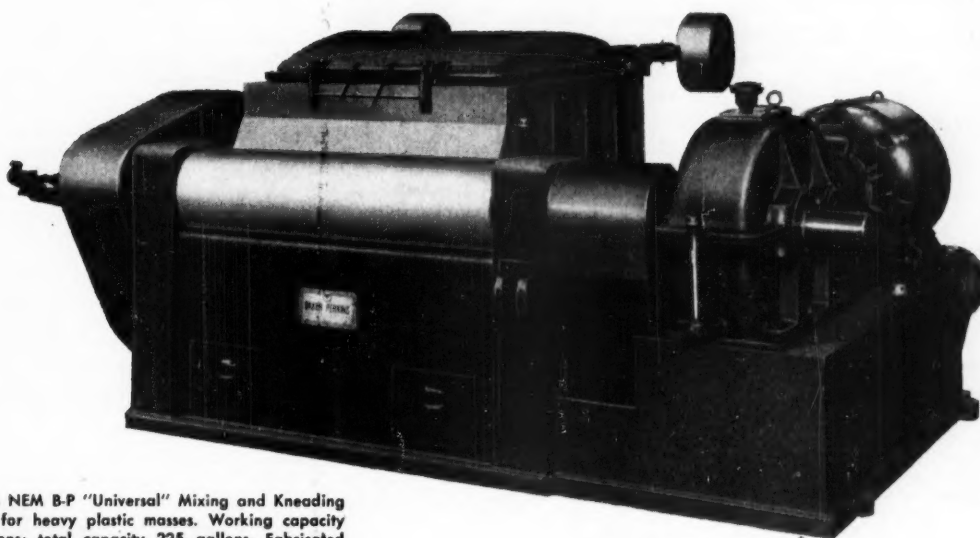
NEMA standards revised, more hp. to frame size for a.c. motors. (150H)

. . . Broad standards allowing more horsepower to frame size for all popular high production a.c. type electric motors from 1 to 30 hp. announced by National Electrical Manufacturers Association. New motors will continue to satisfy fully the same performance standards of torque, temperature rise, starting current limitation

as before. Standards laid out to afford maximum interchangeability between totally-enclosed fan-cooled ratings and open-type ratings utilizing same hp.-frame relationship as far as possible. New standards retain previous frame numbering system. — National Electrical Manufacturers Association, New York 17, N. Y.

**BAKER PERKINS mixers  
will thoroughly mix and knead  
almost any material for the  
chemical processing industry**

There is a BAKER PERKINS Mixer built to efficiently mix and knead materials ranging in consistency from dry powders and light fluids to stiff plastic masses. Close clearance between the blades and trough keep every particle of the material in constant motion so that no part of the batch escapes the thorough mixing action of the blades. Intensive kneading is maintained as the material is pulled and squeezed against the blades, saddle and sidewalls. Consult a B-P sales engineer for full facts.

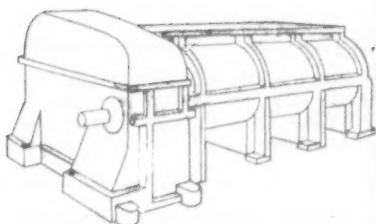


**SIZE 16, NEM B-P "Universal" Mixing and Kneading Machine** for heavy plastic masses. Working capacity 150 gallons; total capacity 225 gallons. Fabricated steel trough shell jacketed for 150 psi. steam or water pressure. Cast iron trough ends are not jacketed. Saddle section has thermocouple for temperature control. Cast steel Sigma or Double Naben blades cored for circulating steam or water. Oil tight gear guards; anti-friction bearings. 50 HP motor.

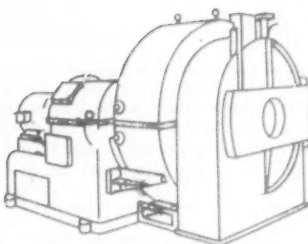
**BAKER PERKINS INC.**

**CHEMICAL MACHINERY DIVISION  
SAGINAW, MICHIGAN**

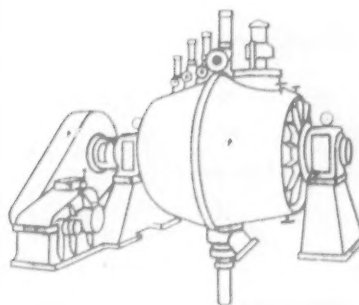
**Other BAKER PERKINS products**



**EQUIPMENT FOR FOUNDRY INDUSTRY**



**CENTRIFUGALS**



**EQUIPMENT FOR RAYON PRODUCTION**

**ELECTRICAL EQUIPMENT . . .**

**Rectifier**

3 to 50 kw. from stock.  
(152A)

. . . Standard unit rectifiers from 3 to 50 kw. are available from stock. Units, converting a.c. to d.c., give same results as motor-generator set. Absence of brushes, bearings, foundations, rotating windings, glass or metal tubes

gives trouble-free operation and almost unlimited life. Fixed or variable voltage d.c. units accommodate any a.c. voltage or frequency input giving high flexibility.—*American Rectifier Corp., New York, N. Y.*

**Rectifier, Mechanical**

Highly efficient, stable,  
long contact life.  
(152B)

. . . Mechanical rectifier unit substitution for providing d.c. power operates at better than 96% efficiency—including losses in transformers, switchgear, associated equipment. Improved me-

chanical design and bias circuits in commutating reactors explain long contact life. No special foundations needed for unit.—*General Electric Co., Schenectady 5, N. Y.*

**Switch, Explosion-Proof**

Controls door opening.  
(152C)

. . . Explosion-proof control switch permits installation of door operators in hazardous locations. Magic Door operators can be used for single, dou-

ble and bi-fold swinging doors as well as for single and biparting sliding doors.—*The Stanley Works, Magic Door Div., New Britain, Conn.*

**Switch, Limit**

Smallest available for  
hazardous locations.  
(152D)

. . . Designed for use on all types of machinery and industrial equipment, limit switch is smallest of its type available. It is a heavy-duty, precision, snap-action type for explosion-proof service. Switch cavity is vented by 4-

in. porous bronze plate fitted over enclosure opening. Flame and hot gases that might originate within the switch are snuffed and cooled while venting through plate.—*Minneapolis-Honeywell Regulator Co., Freeport, Ill.*

**Switches, Speed**

For conveyor controls,  
braking equipment.  
(152E)

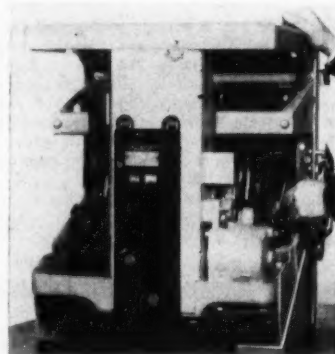
. . . Dazic zero speed switches can be wired to open or close signal circuits at shaft rotation of 15 rpm. on acceleration and 8 rpm. on deceleration. Units are self-lubricating and have hydraulically-driven mechanism and magnetically-coupled electrical contacts.

Recommended applications: conveyor controls and interlocks, operation of braking equipment and adaptation as plugging switches. Being used to indicate stoppages on batch resin mixers.—*Winterburn Mfg. Co., Putnam, Conn.*

**Switchgear, Low-Voltage**

For 600 v. and less, continuous rating from 15 to 4,000 amp. (152F)

. . . Complete line of low-voltage draw-out switchgear (600 v., a.c.) has standardized compartment construction and completely new air circuit breakers. Complete equipment can be manufactured to a specified circuit pattern using standardized circuit breaker, control-instrument and bus compartment building blocks. Result: faster delivery. All breakers have triple-characteristic over-current tripping devices which provide long or short time delay, or instantaneous characteristics as required for different applications.—*General Electric Co., Switchgear Dept., Schenectady 5, N. Y.*



**Tester, Electrical**

Checks current-actuated  
devices.  
(152G)

. . . Multi-Amp checks electrical protective devices to show whether they'll protect. Circuit breakers, overload relays, other current-actuated devices

can be checked before or after installation and during operation. To operate, plug into convenient outlet.—*Multi-Amp Corp., Harrison, N. J.*

**Tester, Portable**

Has built-in ammeter.  
(152H)

. . . Portable tester for current-actuated protective devices has built-in six-range ammeter. Design of model 1005/336 Multi-Amp eliminates need for

use of clamp-on ammeter when running tests. Available through offices of Westinghouse Electric Supply Co.—*Multi-Amp Corp., Harrison, N. J.*

**Transistor**

100 times more powerful.  
(152I)

. . . New transistor overcomes low output problem of previous designs—has output of 20 w., 100 times more powerful than previous models. This permits it to operate motors, valves, relays, etc. Output is higher because

effective means have been found for removing the heat from germanium-alloy junction. Ability to handle more current expands range of uses.—*Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa.*



## • Feeders and Mixers

### Agitator, Fluid

Available in direct and gear-driven styles.

(153A)

... Complete line of portable agitator units is offered in both direct and gear-driven styles. On slow-speed units gears are oil-lubricated and integral with motor rather than agitator shaft. Mechanical seal is used to elim-

inate oil leakage. Agitator shaft bearings are pre-lubricated and sealed for life. Line of mounting accessories is available for shafts and propeller assemblies.—Chemineer, Inc., Dayton 2, Ohio.

### Blender

Mixes fine solids with liquids.

(153B)

... Hydroblender was designed for blending water and iron pyrites but is now being used for blending other fine solids and liquids. It's a long steel box-like unit having two 12-ft. long paddle shafts which revolve in

opposite directions. As the paddles mesh at the center, materials are blended and moved ahead. Finished material is discharged through a spout at the drive end.—McLanahan & Stone Corp., Hollidaysburg, Pa.

### Blender, Laboratory Dry

Full-view operation for solids up to 100 lb. per cu. ft.

(153C)

... Clear, rigid plastic cone of laboratory dry blender gives full visibility of entire operation. Effects of changes in blending times, changes in con-

sistency of raw materials, density differences, etc. can be observed.—The Patterson Foundry & Machine Co., East Liverpool, Ohio.

### Feeder, Air Lock

No flushing with free-flowing materials.

(153D)

... Heavy-duty rotary air-lock feeder prevents flushing of free-flowing materials through stuffing glands and dust seals. Constructed with 12-in. dia. inlet and outlet, the PAV-12 feeder can handle finely ground or granular

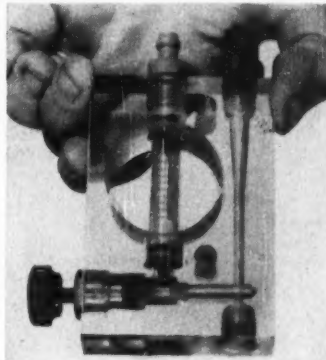
abrasive substances. Unit runs equally well under pressure or suction. It has a closed pocket rotor and is available either with or without packaged power.—Prater Pulverizer Co., Chicago 50, Ill.

### Feeder, Chemical

Actuated by bypass, feeds small quantities.

(153E)

... Compact Feedrator simultaneously meters, controls, mixes and dispenses small proportions of liquid chemicals. A built-in ejector eliminates need for a proportioning pump. All that's needed for operations is sufficient main-line pressure-differential to create a bypass flow through the ejector. Reagent flow rate is controlled precisely through manipulation of a needle valve. Should main pressure drop, a ball check valve prevents backflow of the main stream into the reagent tank. Four standard models provide reagent feeding capacities from 0.03-0.3 to 2-20 gph.—Fischer & Porter Co., Hatboro, Pa.



### Feeder, Gravimetric

For small plants, no calibration required.

(153F)

... Model GLW-O feeder offered where low cost, accurate gravimetric feeding is required. Accuracy: better than 99% delivering either powdered, granular or lump material up to  $\frac{3}{4}$  in. size. Feed range can be set from 0 to 100%

for capacities from 0.25 to 100 lb. per hr. Operation is simple. Rate is set on single dial. No calibration is ever required. Feed hopper capacity is 5 cu. ft.—Omega Machine Co., Providence, R. I.

### Feeder, Gravity

Holds constant rate from  $\frac{1}{4}$  pt. to 500 gal. per day.

(153G)

... Gravity-type liquid feeder maintains constant feed rate. Rate is adjusted by a valve that meters air delivered to supply tank. Feed can be varied from less than  $\frac{1}{4}$  pt. to more than 500 gal. per day. Each Liqui-

feeder includes combination sight glass and bubble-type flowmeter. Rate of liquid feed is indicated by bubble frequency in sight glass. Choice of construction materials.—Hankison Corp., Pittsburgh 16, Pa.

### Feeder, Paper Stock-Chest

Reduces hang-up of solids.

(153H)

... Side-Flo feeder mechanism at inlet point of paper stock-chests greatly reduces common difficulty—tendency of stock to stick or hang to sides of chest. Motor-driven impeller throws stock to outer chest walls. With extra

weight added at this point, flow from bottom discharge valve pulls stock from entire cross-sectional area of chest. No longer does material dry on walls to become contaminant.—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

**FEEDERS AND MIXERS . . .**

**Feeder, Pressure**

Feeds solids against steam pressures up to 120 psi. (154A)

. . . Rotary feeder for feeding solids against pressure offers new possibilities for continuous processing. Feeder is a cylindrical rotary valve mounted horizontally. In valve-rotor are two spherical pockets. Raw material feeds

into these pockets in the "up" position. When the rotor turns 180 deg. contents drop into vessel. Feeders will operate against steam up to 120 psi.; use 2 to 5 hp.—*American Defibrator, Inc., New York 17, N. Y.*

**Feeder, Process Pressure**

Feeds bulk materials without interrupting process operation. (154B)

. . . Collins-Adey differential pressure feeder will move materials continuously from high vacuum to atmospheric pressure or it will feed from atmospheric pressure into pressure zones as high as 10,000 psi. Feeder, mechani-

cally operated, moves material by gravity or mechanical means. Each unit is designed to meet individual plant processing needs for free-flowing or slow-moving solids.—*John T. Collins & Co., Summit, N. J.*

**Feeder, Reagent**

Made of rigid PVC, low initial cost. (154C)

. . . For service on wide range of corrosive chemicals, Model E reagent feeder is available with unplasticized polyvinyl chloride construction. Material provides higher resistance to corrosive sulfuric, hydrochloric and nitric acids, copper sulfate, ferric chloride, etc. Performance is comparable to Model E reagent feeder previously available in other materials of construction.—*The Clarkson Co., San Francisco, Calif.*



**Feeder, Rotary Solids**

For pressure or vacuum. (154D)

. . . Bulk feeding of solids under high pressure or vacuum is done with rotary-feeder air lock. Applicable to chemical and food processing, feeder is available in cast iron, stainless steel,

monel. Application on high-pressure systems is possible because sealing members on rotor ends are supplemented by inert gas.—*Beaumont-Birch Co., Philadelphia, Pa.*

**Feeder, Vibrating**

Feeds over wide range, very quiet. (154E)

. . . Vibrating feeder feeds wide range of outputs. Based on English design, unit can deliver 0.1 to 20 cfm. grain, rock, fertilizer or chemical products.

Working frequency is 1,850 vibrations per min.; conveying rate at maximum amplitude is about 50 fpm.—*Richardson Scale Co., Clifton, N. J.*

**Impeller, Mixing**

Underdriven to stop aeration. (154F)

. . . Bottom-drive model of the Ultrafast Dissolver eliminates aeration and permits easy pressurizing of the tank. Motor is mounted beneath the bottom of the tank. Impeller shaft enters from

that point. Developed for blending polyethylene and wax it is available in a wide range of tank capacities and can be built to customer specification.—*Cowles Co., Inc., Cayuga, N. Y.*

**Mixer, Cylinder**

Coats fibers uniformly, rapidly. (154G)

. . . Asbestos fibers are uniformly coated with carbon black through use of special cylinder mixer. Finished batch is loose and fibrous throughout

with individual fibers thoroughly coated. Efficient mixing is done by prongs or spiders which comb fibers.—*Paul O. Abbe, Little Falls, N. J.*

**Mixers, Dispersion**

For high intensity jobs, operate in 30 to 300 gal. batch range. (154H)

. . . Dispersator line of high-intensity mixers has two additional drive units. Series 2400 is designed for beam or channel mounting with open tanks; Series 3200 is for flange-mounting sealed-system operations. In 250 cps.

range mixers will handle from 100 to 600 gal.; in 1,000 cps. range 50 to 250 gal.; for viscosities of 5,000 cps. intensive mixing is obtained from 15 to 100 gal.—*Premier Mill Corp., Geneva 1, N. Y.*

**Mixer, Dry Chemical**

Uniformly blends dry chemicals. (154I)

. . . A line of complete package mixing plants is equipped to handle batches from 500 to 4,000 lb. per hr. Plant consists of ribbon mixer with cut-in hopper, elevator, conveyor, stack-

ing bin, motor drives and controllers. Valve bag packer and packers for open mouth bags and drums also can be furnished.—*John W. Williamson & Son, Montbello, Calif.*

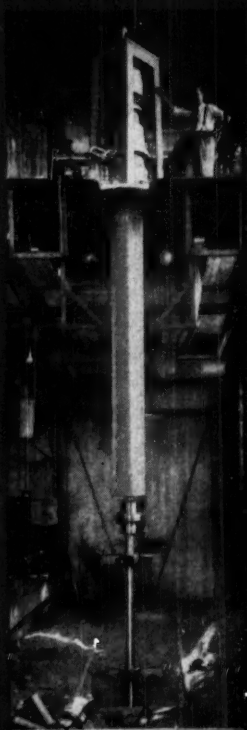
**Mixer, Heavy-Duty**

Mixes wet or dry. (154J)

. . . Mixer designed to handle both heavy wet and dry materials is available in 1- and 1½-ton sizes. Continuous

scooping and sweeping action within mixer assures high uniformity.—*Rapids Machinery Co., Marion, Iowa.*

# Eastern Mixers lick the Tough



There's an Eastern Mixer to handle every field mixing problem. Whatever your process is, Eastern will meet and the problem is gone—no more sticky lumps, no more clogging, and at moderate cost. In nearly every industry engaged in processing of liquids, Eastern mixers have repeatedly proved themselves over and over again.

Eastern Mixers come in a variety of sizes and types. From 1/2 gallon laboratory models weighing less than a pound, to giant tank mixers, Eastern mixers are the gamut of mixing for all kinds of mixing jobs.

Portable open laboratory MIXERS are constructed for hard, continuous work. PORTABLE MIXERS are available with large variety of choices in shaft, horsepower, motor, and mounting arrangement. TOP AND DISC CHURNING MIXERS with churning action one of the big jobs. Both portable and turbine type units are available in a large variety of sizes and ratings.

When engineering the purchase of field mixing equipment, send for Eastern Data Sheet. Our engineering staff will specify the most efficient unit according with the data of your particular problem.

Request a helpful catalog by writing for Catalog No. 12.

## Eastern



INDUSTRIES, INC.  
10000 STREET  
EAST NORWALK, CONN.

**FEEDERS AND MIXERS . . .****Mixer, Laboratory**

Explosion-proof, mixes,  
blends. (156A)

. . . Portable electric laboratory mixer is available in new construction for handling hazardous materials. Mixer is direct-connected to 1/20 hp., 1,750

rpm. motor. It will mix up to 50 gal. of low viscosity liquid or a lesser volume at higher viscosity.—*Mixing Equipment Co., Rochester 11, N. Y.*

**Mixer, Paste**

For heavy materials, has  
new feature. (156B)

. . . Imperial mixer facilitates fast thorough mixing of heavy plastics and colors as well as sludge reclamation in paint and enamel. Prominent feature of mixer is an air-sealed stuffing box. Pneumatic pressure of 4 to 10 lb. pro-

ducts product from contamination by lubricants; it also guards bearings from damage by abrasive mixture. Carbon dioxide can be used in place of air.—*The J. H. Day Co., Inc., Cincinnati 22, Ohio.*

**Mixer, Propeller**

Speeds up liquid blending,  
heating, solution of  
solids. (156C)

. . . MixMor portable propeller mixers are offered in sizes from  $\frac{1}{4}$  to 3 hp. Units can be furnished with drip-proof, totally enclosed or explosion-proof mo-

tors. Shafts and propellers can be constructed of ordinary metals or stainless steel.—*L. H. Butcher Co., San Francisco 1, Calif.*

**Mixers, Variable Speed**

In range of sizes.  
(156D)

. . . Vertical mixers with variable speed drives are offered in range of sizes from  $\frac{1}{4}$  to 25 hp., inclusive. Mixers provide speeds infinitely variable

for correct agitation of materials. They can be provided with stuffing box and lantern gland for pressure or vacuum.—*Conn & Co., Warren, Pa.*

**• Filters and Dust Collectors****Aid, Filter**

Low cost, from coal, in-  
soluble in caustic.  
(156E)

. . . AnthraAid, carbonaceous filter aid, is insoluble in caustic, highly incompressible for filtering viscous materials at high pressure. Forms excellent precoat and has less tendency to adhere to cloth, thus improving cake discharge.

On continuous precoat filtering, it has shown excellent shaving characteristics. Material is resistant to particle size breakdown. Four grades are available.—*Anthracite Equipment Corp., Wilkes-Barre, Pa.*

**Assembly, Blow Ring**

Self-adjusting for Aero-  
turn dust collector.  
(156F)

. . . Through use of light-weight aluminum casting, blow-ring carrier provides self adjustment of rings around individual dust tubes. Entire ring assembly is mounted so that it floats laterally to accommodate variations in vertical alignment of bags under all conditions. Design eliminates unnecessary wear in concentrated areas along bag surfaces. Weight reduction up to 50% means comparable reduction in power requirements and motor size to drive assembly.—*Turner & Haws Engineering Co., Boston, Mass.*

**Clarifier**

For white liquor, makes  
pulp brighter. (156G)

. . . White liquor polishing station provides final polish to white liquor clarifier effluent. Removes suspended colloidal particles which affect pulp brightness. Polishing station consists of

one or more vertical pressure-type filters together with necessary piping, valves and control instruments. Minimum operating attention required.—*The Dorr Co., Stamford, Conn.*

**Collector, Cyclone Dust**

Improved for gas tem-  
peratures to 800 F.  
(156H)

. . . Cyclone dust collector is efficient and economical. Dustmaster cyclones are recommended for collecting and separating all types of dry industrial dusts where gas temperatures do not

exceed 800 F. Units also used as pre-cleaners for filters and electric precipitators. Operation either under suction or pressure.—*A. W. Banister Co., Inc., Cambridge, Mass.*

**Collector, Dust**

Mounts on hopper, for  
dry chemical dusts.  
(156I)

. . . Dust collector removes nuisance and toxic dusts raised during handling of dry chemicals. Although essentially a small machine, maximum filter area is attained by collecting dust on outside of small diameter. Collector designed

for mounting on hopper has built-in loading chute and returns dust directly to hopper when filter tubes are shaken. Two capacities available; 200 and 400 cfm.—*Wallace & Tiernan, Belleville 9, N. J.*



**Collector, Dust**

Tube type for fine dry dust. (157A)

... Similar in principle to other collectors of this type the Amerjet reverse-jet cloth-tube collector offers some different design features. Individual floating tension weights connect each cloth tube with the dust storage hopper. This keeps tube diameter constant despite different temperature and humid-

ity conditions. No reversing mechanism is needed on the reverse-jet drive. Tube clamps are quick-fastening. Venturi inlets cut dust abrasion of fabric. Rubber air-supply tubes connected to the jet are retractable as jet moves up and down the tube.—*American Air Filter Co., Louisville 8, Ky.*

**Collector, Dust**

Self-contained bag type for indoor use. (157B)

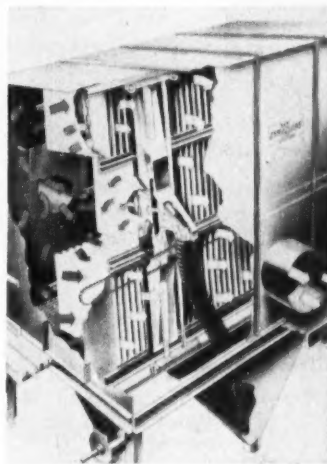
... Designed for indoor use the type CN unit dust collector handles smaller volume jobs economically and efficiently. Bags are made of heavy-weight sateen-weave cotton filter fabric stitched

vertically to form multiple tubes. Collector casings are constructed of heavy-gauge steel. Seven sizes range from 200 to 1,000 sq. ft. of cloth area.—*Pangborn Corp., Hagerstown, Md.*

**Collector, Dust**

Fully continuous, constant suction. (157C)

... Dynaclone dust collector offers advantage of fully continuous operation with constant suction at the dust sources. Elimination of shaking (conventional operation) and abrasion of mechanical cleaning devices materially increases bag life. Reverse air used for cleaning is developed by main suction fan. This eliminates constant source of maintenance trouble since no auxiliary fan drives need be located within the filter case. Dynaclone is particularly effective for trapping fine dust down to 0.5 microns on a continuous and non-interruptible basis. On all material being handled, no visible dust discharge is apparent at the fan outlet. Materials now being collected include cement, carbon black, soapstone, soybean meal, lime, coke, alumina, detergents, plastics.—*W. S. Sly Mfg. Co., Cleveland 2, Ohio.*

**Collector, Dust**

Cleaned by reverse air flow, lower maintenance, operating costs. (157D)

... Reverse air flow provides continuous cleaning of filter surfaces in Type CH-3 self-cleaning cloth-screen dust collector. This permits continuous dust collection with constant air volume and suction; also maintenance and operating costs are lowered. Cleaning is accomplished by action of traveling

manifold. Mounted integrally with manifold is reverse air blower which takes its air directly from clean air side of collector. Existing installations of Type CH cloth screen collectors can be converted to self-cleaning arrangement.—*Pangborn Corp., Hagerstown, Md.*

**Eliminators, Dust and Fume**

Use wet and dry cleaning, 500 to 50,000 cfm. (157E)

... Centri-Merge vertical-rotor wet-type dust and fume eliminators are available in two different models. One unit is used for wet collection and elimination only. The other is a combination primary dry and secondary wet collection unit. Combination unit recovers bulk of material in dry pre-cleaner. Units have low ratio of power to rated capacity, high ratio of water

circulated to air volume handled, independently driven rotor and fan, automatic liquid-level control. Both units combine the cyclonic principle of dust separation with positive high pressure water action. Solids are removed by dragging, skimming or manually. Sizes range from 500 to 50,000 cfm. capacity.—*Schmieg Industries, Inc., Detroit 34, Mich.*

**Fabric, Filter**

Dynel felt for press or vacuum filter. (157F)

... Dynel felt filter-medium yields highly efficient cake formation and clarified filtrate. Material recommended for filter press or vacuum filter. It's used for dyestuff manufac-

ture, production of yeast, chemicals, food products. Medium is resistant to bacteria, acids, alkalis. Operating temperature range is -20 to +150 F.—*American Felt Co., Glenville, Conn.*

**Fabric, Non-Woven Filter**

High porosity, flow rate; easily cleaned. (157G)

... Viskon non-woven fabric is web of either cotton or rayon fibers bonded with an insoluble agent and having high wet strength. Competitive with filter-paper medium, fabric can be used alone or as auxiliary filtering membrane

draped over expensive filter cloths to prolong their life. Advantage: high porosity resulting in high flow rate. Service life is long on alkalis and petroleum products.—*The Visking Corp., North Little Rock, Ark.*

## FILTERS AND DUST COLLECTORS . . .

**Fabric, Polyethylene Filter**

For free-filtering crystals  
and pulps. (158A)

. . . Woven of polyethylene a new monofilament filter fabric is similar to a fine wire cloth. It is recommended for free-filtering solids such as coarse crystals or fibrous pulps. Fabric will operate continuously without plugging

and can be cleaned easily. It combines an excellent chemical resistance with toughness, abrasion-resistance and excellent flexing at low temperature.—*Filtration Fabrics Div., Filtration Engineers, Inc., Newark 4, N. J.*

**Fabrics, Synthetic Filter**

Have ravel-proof edges.  
(158B)

. . . Filter bags, dust collector tubes, filter press cloths are custom made of synthetic fabrics so that all edges and holes are ravel-proof. Fabrics cut with specially-designed electrically-heated blades. Blades melt through synthetic fibers, fusing loose ends firmly together so they can't separate. Result: tightly bonded edge as dependable as selvage edges or button-hole stitching.—*Filtration Engineers, Inc., Newark 4, N. J.*

**Filter, All-Metal Industrial**

For petro products, re-  
moves contaminants over  
2 microns. (158C)

. . . Complete line of industrial filters, for petroleum industry, uses porous-metal filter medium. Filters with Filterall element remove all plus 2 micron contaminants from any liquid with minimum pressure drop. Elements made of carefully-sized, spherical, metal particles sintered under controlled

atmosphere. Porosity of structure depends on size of particles used. Solvent washing completely rejuvenates elements. Sizes range from small units for lubricating and hydraulic oil to 600-gpm. units for bulk diesel fuel, gasoline and jet fuels.—*Permanent Filter Corp., Los Angeles 39, Calif.*

**Filter, Compact In-Line**

Uses plastic filter me-  
dium, clarifies strong  
corrosives. (158D)

. . . Porous Kel-F material is filter medium in compact in-line filters. Filter elements will remove from liquids all particles larger than 5 microns. On gas filtration even finer

particles can be separated. Top temperature range is 350 F. Tensile strength is 900 lb. per in.; modulus of elasticity 18,000 psi.—*Porous Plastic Filter Co., Glen Cove, N. Y.*

**Filter, High-Pressure**

Two series for liquids  
and gases. (158E)

. . . Series 1H and 1HG high-pressure liquid and gas filters are available for operating pressures up to 1,000 psi. On liquid filtration, filter has capacity of 15 gpm. for a viscosity of 150 SSU, with 2 lb. pressure drop and 50 mi-

cron degree of filtration. For gases at 1,000 psig., maximum capacity is 200 cfm. of free air with 2 lb. pressure drop and 25 micron degree of filtration.—*Cuno Engineering Corp., Meriden, Conn.*

**Filter, Horizontal Rotary**

Built-in drive, high effi-  
ciency on coarse crystals.  
(158F)

. . . A self-contained driving unit mounted in the frame of Feinc horizontal, rotary, vacuum filter eliminates costly foundations. Filter is efficient on coarse crystals, fibrous pulp and other free-filtering substances. It has a revolving pan with cloth- or screen-

covered wedge-shaped sections. Valve connected to each section controls dewatering, washing and discharging operation as table rotates. Finished cake is removed by a scroll and dropped into a chute or conveyor.—*Filtration Engineers, Inc., Newark 5, N. J.*

**Filter, Horizontal Vacuum**

Washes efficiently using  
less water. (158G)

. . . Continuous vacuum filter duplicates action of Buechner funnel to give a more efficient wash using less water. Construction features individual trays or cells located in the rim position on a horizontally-mounted rotating filter wheel. Vertical sides of trays prevent runback or cutback of original or wash

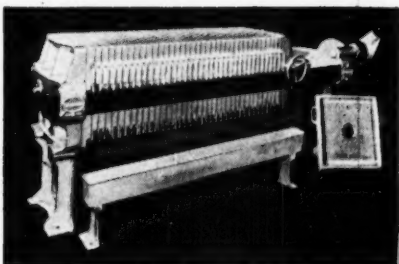
liquors. Result: stronger original liquor and reduced concentrating costs. As many as five countercurrent washing stages can be used. Cake is discharged by turning over tray and dumping with help of reverse air blast. Cloth is then washed by jet sprays.—*Bird Machine Company, South Walpole, Mass.*

**Filter, Plate and Frame**

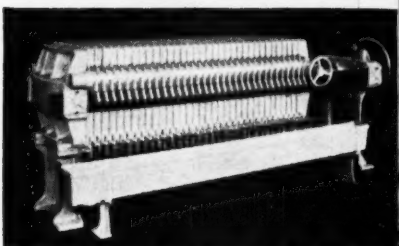
Paired frames cut labor  
cost. (158H)

. . . Duplicate sets of frames mounted opposite each other on a single long shaft give plate and frame filter more efficient operating characteristics. While one of each pair of frames is working in filter the other is projecting outside the filter where it can be cleaned and readied for the next cycle while the filter is running. This design fea-

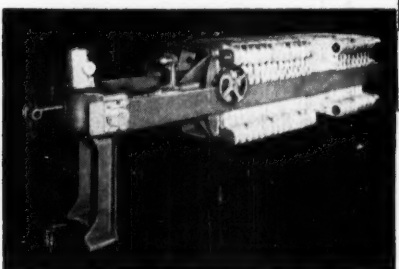
ture keeps filter on the line a greater proportion of the time; cuts labor cost per unit of product. Feed enters at the bottom forming more uniform cake, and one that is split up the middle. Net result: more uniform penetration of wash water over shorter distances for better washing.—*Eimco Corp., Salt Lake City, Utah.*



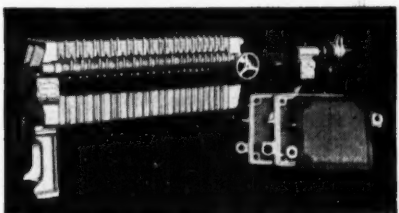
Recessed plate, center feed, open discharge filter press.



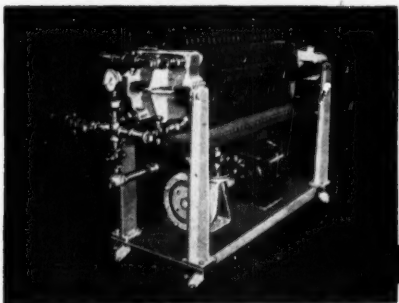
Side feed, open discharge, washing type filter press.



Double side feed, double closed discharge filter press with quick-acting Shriver Hydro-Kloser mechanism.

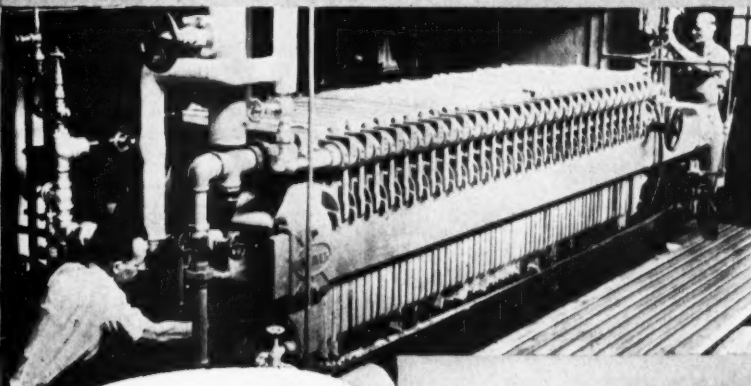


Corner feed, washing type filter press, with hollow plates for heat circulating medium.



Portable unit: closed delivery, washing type filter press with pump.

*For ALL These Jobs -*  
**CLARIFICATION • RECOVERY OF SOLIDS  
 WASHING - EXTRACTION - DRYING OF  
 FILTER CAKE • THICKENING OF SLURRY**



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**SHRIVER  
 FILTER  
 PRESSES**

If you want to improve filtration quality and economy, plan on a Shriver Filter Press. No filter matches it for versatility, operating flexibility and assured production capacity under practically any conditions.

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## FILTERS AND DUST COLLECTORS . . .

**Filter, Multiple Surface**

Porous metallic medium,  
large capacity. (160A)

. . . Filter with high-temperature-resistant medium of porous stainless steel now available for high capacities. It is recommended for clarification and solids-collection, handling such diverse liquids as water, petroleum products and molten metals. Container can be either carbon or stainless steel as needed. Design permits construction to meet high pressure requirements, sanitary needs or jacketing for heating. Sizes range from 30 to 720 sq. ft. with a cake capacity of 35 cu. ft.—*Micro Metallic Corp., Glen Cove, N. Y.*

**Filter, Porous**

Made of Kel-F plastic,  
filters corrosives. (160B)

. . . Fine pore structure of Kel-F, poly-trifluorochloroethylene plastic, makes it ideal as gas sparging element in corrosive solution and where severe thermal cycling occurs. Material is non-wetting and has zero water ab-

sorption. Dimensional stability: from -320 to +390 F. Kel-F is available in disk and corrugated high-area units and in square stock sheets. It will stop particles over 5 microns.—*The M. W. Kellogg Co., Jersey City 3, N. J.*

**Filter, Small Process**

Removes pyrogens, bac-  
teria. (160C)

. . . Using asbestos filter sheets model 8-ESS filter effectively removes pyrogens and bacteria. Also it's said to be useful for filtration of perfumes, essential oils,

drugs, pharmaceuticals, chemicals. Filter is available in stainless steel, Lucite and stainless steel, or all Lucite.—*Ertel Engineering Corp., Kingston, N. Y.*

**Filter, Tank**

Filter cake removed in  
jiffy. (160D)

. . . Manpower needs for tank-filter operation have been sliced on model MCR. Filter can be opened with all plates exposed in 60 sec. Filters fur-

nished in wide selection of construction materials, including rubber or plastic lining when desired.—*Sparkler Mfg. Co., Mundelein, Ill.*

**Filter, Vacuum Disk**

All elements on one  
base. (160E)

. . . Both floor space and headroom have been saved by mounting all de-watering elements of Denver filter on one base. The vacuum disk filter uses a wet vacuum pump eliminating need for moisture trap with overhead piping. Design permits vacuum to be held on startup. A valve on the suction

line maintains suction only on the submerged portion of the disk. Once uniform cake is formed on all segments then normal vacuum distribution is resumed by a simple valve adjustment so that formed cake will dewater.—*Denver Equipment Co., Denver 17, Colo.*

**Plate, Filter**

Light weight and easy  
to handle. (160F)

. . . Improved filter pressing efficiency is claimed through use of the Multi-plate, a new light-weight element. Drainage shield of corrugated stainless steel or other selected metal is supported or welded in a rugged channel frame

or solid rim. Resultant structural strength is much greater than required to withstand maximum filtration pressure. Plate can be used in any conventional filter press. — *Multi-Metal Wire Cloth Co., New York 59, N. Y.*

**Press, Hydraulic Filter**

Develops high pressure  
squeeze. (160G)

. . . Hydraulic filter press handles filtering jobs calling for maximum dryness or purity of cake. Initial operating step is similar to conventional filter press. Material is pumped into press through a feed manifold. Filtra-

tion is performed at pressures up to several hundred pounds per sq. in. Cakes formed are pressed hydraulically using pressures as high as 6,000 psi. Compressed cakes are ejected.—*Fred S. Carver, Inc., Summit, N. J.*

**Sheet, Metallic Filter**

Porous, doubled tensile  
strength. (160H)

. . . Grade X metallic filter sheet is porous with mean pore opening of 10 microns. Advantages over previous materials: twice the tensile strength, smooth surface, close thickness tolerance. Tensile strength about

25,000 lb. per in. More ductile than porous stainless-steel filter sheets. Available in sheets 0.040 in. thick. Can be made in forms similar to stainless steel hitherto furnished.—*Micro Metallic Corp., Glen Cove 10, N. Y.*

**Strainer**

Low cost, for process  
streams. (160I)

. . . Oversized particles can be removed continuously from process streams by low-cost Bantam strainer. Device handles fibrous or viscous slurries. It's

equipped with motor-driven scraper or brushes to remove particles from strainer openings.—*Merco Centrifugal Co., San Francisco 11, Calif.*



## • Heaters and Coolers

### Air Conditioner

Two units in one housing.  
(161A)

... Improved apparatus for treating air combines air conditioner and absorbent reconcentrator in one compact unit. Required floor space compared to previous models is halved. Conditioner gives complete control over air relative humidity and temperature. Temperature and humidity of treated

air is governed by the temperature and absorbent spray concentration of Hygrol. Unit is controlled by thermostats. Heat interchange between the air conditioning section and Hygrol recovery section improves operating economy.—Niagara Blower Co., New York 17, N. Y.

### Boiler, Packaged

Minimum floor space  
and head room. (161B)

... Line of shop-assembled VP water-tube boilers operates in medium pressure range to 250 psig. with steam capacities from 4,000 to 30,000 lb. per hr. Design based on 2-drum, vertical-bent-tube arrangement with water-

cooled furnace in front of convection surface. Unit comes assembled with firing equipment, setting, forced draft fan and automatic control ready to be set up. — Combustion Engineering-Superheater, Inc., N. Y. 16, N. Y.

### Boiler, Packaged

Small, space saving.  
(161C)

... Claimed the smallest 50 hp. fire-tube steam boiler ever manufactured Cyclotherm C1725 requires half the floor space and 2 ft. less head room than other steam generators of equal horsepower. Boiler weighs 3,550 lb.,

occupies 20 sq. ft. and stands 4 ft. 8½ in. high. No cement foundation is necessary. Simple flue vent permits continuous operation at about 80% efficiency. — Cyclotherm Div. U. S. Radiator Corp., Oswego, N. Y.

### Boiler, Packaged

Rated at 125 hp., is self-contained.  
(161D)

... For industrial and processing applications a new boiler package develops rated hp. efficiently under normal operating conditions. It is rated at 125 hp., is self-contained with fully-automatic Scotch design. Once utility

lines are connected it is ready to operate. All working areas and surfaces are large. This means high heat output without strain; extra reserve eliminates fluctuations in pressure.—Eclipse Fuel Engineering Co., Rockford, Ill.

### Burner, Anthracite

Boosts boiler output, top  
efficiency 10 min. after  
firing up. (161E)

... Output of steam and hot water boilers can be boosted by at least 15% with automatic-firing anthracite burner. Output is increased by unique design that circulates water through burner to boiler. Heating capacity of one sq. ft. of active burner area equals 5 sq.

ft. of prime boiler surface. Fire-Jet burner can be used with either steel or cast iron boilers. Any standard anthracite grades give top performance. Program firing can be used where heat demand is intermittent.—Electric Furnace-Man, Inc., Emmaus, Pa.

### Burner, Line Retention

Gas-fired, insures good  
combustion at all pressures.  
(161F)

... Gas-fired retention-type line burner comes in sections for assembly on the job to meet requirement. Unit supplies heat from a continuous flame distributed over a wide area. Can be used for oven and kettle heating, and air

heating installations including make-up air for spray booths. Blast-type burner design insures good combustion with rich, neutral or lean mixtures at all pressures.—Eclipse Fuel Engineering Co., Rockford, Ill.

## Your Inventory of New Equipment and Accessories

### What It Contains . . .

This inventory digests some 571 of the most important new or improved equipment items developed or commercialized during the second six months of 1953 and the first six months of 1954. It stresses only those developments of major interest to chemical engineers in the chemical

process industries. For more about any item, write its code number on one of the Reader Service postcards (p. 35) then mail to us.

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**HEATERS AND COOLERS . . .**

**Coils, Plate-Type**

Cost less than pipe coils.  
(162A)

. . . Thermo-Panel plate coils can replace pipe coils in tank heating and cooling. Use of Thermo-Panel eliminates need for expensive pipe cooling. Plate coils also are used as radiant

cooling panels around furnaces. Low cost and light weight are outstanding features. They are easy to replace and simple to clean.—Dean Products, Inc., Brooklyn 28, N. Y.

**Conditioner, Packaged Air**

Mounts on roof.  
(162B)

. . . Air conditioning unit with 2-ton capacity mounts on roof. Single or double units can be concentrated where the heat load is heavy. Condenser is mounted on a hatch on the roof. Two stanchions extending through the roof support the evaporator in the space to

be cooled below. Refrigerant circulates through the stanchions between evaporator and condenser. Unit parts are encased in aluminum jackets for long life. Air condensate is pumped to the roof and evaporated.—Kritzer Products, Chicago 22, Ill.

**Cooler, Cascade Graphite**

High cooling water capacity.  
(162C)

. . . For increased effectiveness, Series CC Karbate sectional cascade coolers offer: type SN armored connections (no nozzles), radiused crossover between sections for high fluid velocities with minimum pressure drop, high cooling water capacity, redwood water-guide strips with stainless-steel clip springs, Teflon gaskets that eliminate gasket replacement and maintenance. Cooler recommended for handling practically all acids, caustics and organic solvents up to 75 psig. and 338 F. Higher temperature gases handled by changing method of applying cooling water.—National Carbon Co., New York 17, N. Y.



**Coolers, Centrifugal**

In smaller sizes, same advantages as larger sizes.  
(162D)

. . . Line of centrifugal refrigerating machines is extended to include units from 75 to 200 tons. Advantages are: long machine life at high efficiency, compactness, freedom from service problems. Machine is only one in this

size range that can be connected to any type of drive. Can be adapted to automatic constant speed with synchronous motors for correcting building or plant power factor.—Carrier Corp., Syracuse 1, N. Y.

**Dehumidifier, Chemical**

Supplies sub-freezing air.  
(162E)

. . . Sub-freezing air now produced by individual units having capacity of 17,000 cfm. Use of refrigerants (brine, methanol, Freon, ammonia, chilled water) increases air-moisture-absorbing capacity. Low dewpoint, sub-freezing

air supplied continuously and automatically to process areas without frost formation. Result is maximum time cycle for operation of low temperature processes. — Kathabar Division, Surface Combustion Corp., Toledo 1, Ohio.

**Dehumidifier, Compressed Gas**

Dual chambers for continuous operation.  
(162F)

. . . Dehumidification chambers remove moisture from air and other gases that are passed through a bed of solid desiccant contained therein. Unit is fitted with dual chambers. While one chamber dries gas, the other regenerates. Each chamber has an internal

heater to provide vaporization heat for moisture held by the desiccant. Finned chamber design gives uniform heat distribution necessary for perfect desiccant regeneration. Uniform generation of heat depends on electrical element.—Industrol Corp., Roselle Park, N. J.

**Dryer, Automatic**

High-speed, continuous for heat-sensitive materials.  
(162G)

. . . High-speed automatic dryer dries heat-sensitive materials uniformly. Two key features are: maximum exposure of product surface to drying air and ability to supply a low humidity, low

temperature air for drying. Used in gelatine and glue processing. Shows promise for soap, food and pharmaceutical industries.—Surface Combustion Corp., Toledo 1, Ohio.

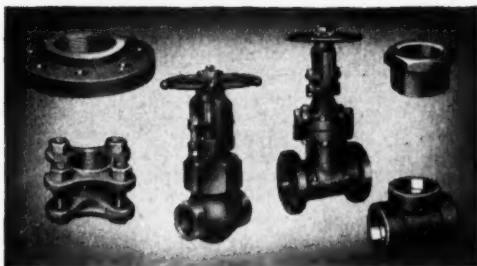
**Dryer, Cylindrical**

Dries heat-sensitive solids, no particle scorching.  
(162H)

. . . DehydrO-Mat cylindrical dryer dries heat-sensitive solids without scorching particles. Through use of varying cross-sectional area in one shell, unit changes velocity of air and solids as they pass through. Thus product retention time can be controlled. At

same time temperature is adjusted in each zone to give optimum drying. Control of dryer is handled automatically through an electronic-pneumatic system that controls flow of fuel and air.—Edward Renneburg & Sons Co., Baltimore, Md.

# Designed for today's *Tough* service demands



## DROP FORGED VALVES AND FITTINGS FOR TOUGHNESS AND TROUBLE-FREE SERVICE

Drop forged from carbon and alloy steels, Voegt valves, fittings and flanges will safely handle liquids and gases at high pressures and high temperatures in power plants, chemical plants, petroleum refineries, etc. The complete line includes flanged, screwed and socket weld end globe, gate and check valves—ells, tees, and crosses—couplings—bushings—plugs—unions—flanges and flange unions—and welding heads.

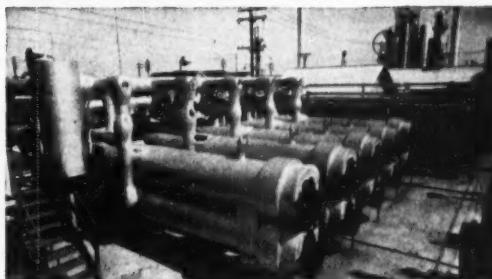
## MODERN STEAM GENERATORS

Voegt steam generators are designed to give maximum rating in a minimum of space, with high efficiency and low maintenance expense. Bent tube types and straight tube, forged steel sectional header types to burn solid, liquid or gaseous fuels meet every power, process or heating requirement.



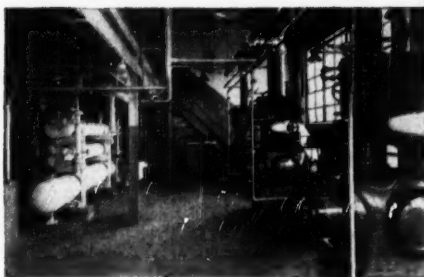
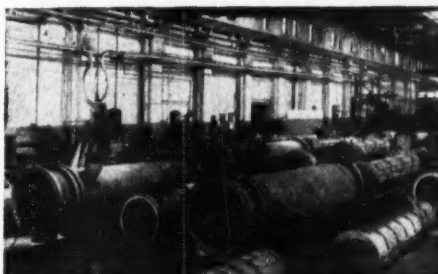
## PROCESS EQUIPMENT FOR EVERY SERVICE

Voegt constructs process equipment in wide variety to all Codes. Stills and towers, oil chillers, crystallizers, heat exchangers, molding machines, etc., serve in the manufacture of oils, greases, 100 octane gasoline, synthetic rubber, chemicals and related products around the world.



## SPECIAL MATERIALS COMBAT CORROSION AND PRODUCT CONTAMINATION

Our modern shops produce a wide variety of equipment from special metals and alloys to fight corrosion and product discoloration or contamination. Fabrication procedures insure that corrosion resistant properties of welds will match that of the materials used to construct the equipment.



# Voegt

## PRODUCTS

FOR REFINERIES, CHEMICAL PLANTS  
POWER PLANTS AND PROCESS INDUSTRIES

**HENRY VOGT MACHINE CO.**  
**LOUISVILLE 10, KY.**

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## MORE REFRIGERATION TONNAGE AT LESS COST

More than 70 years of engineering and manufacturing experience is incorporated in Voegt refrigerating and ice making equipment. Absorption Systems, Compression Systems, and Tube-Ice Machines in a wide range of capacities serve industrial and processing plants, and institutions, here and abroad.

## HEATERS AND COOLERS . . .

**Dryer, Freeze**

Self-contained for small operations. (164A)

. . . Built in either stainless steel or glass, compact freeze-drying units can process small to medium quantities of bacteria, plasma, antibiotics, germs, viruses, hormones and other labile

pharmaceuticals and biologicals. Drying units are completely self-contained eliminating the need for conventional dry ice chambers. — E. Machlett & Son, New York 10, N. Y.

**Dryer, Rotary Steam Tube**

Fabricated of aluminum. (164B)

. . . Giant dryers measuring 10 ft. in dia. and 100 ft. long are fabricated of aluminum with exception of outer shell. Lining is #61S alloy plate; steam tubes and longitudinal finned tubes in one portion of the drying area

are fabricated from 63S alloy; aluminum castings support the pipes and tubes. Total heating surface is 23,700 sq. ft.—Louisville Drying Machinery Unit, General American Transportation Corp., Louisville, Ky.

**Dryer, Vacuum**

In double-cone form, speeds drying. (164C)

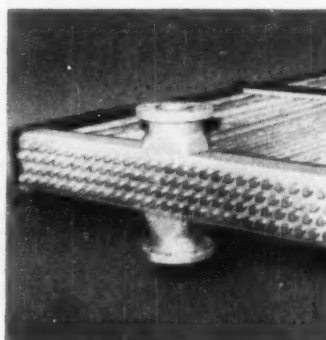
. . . For drying heat-sensitive or easily-oxidized materials the Conaform double cone vacuum dryer does a fast, complete job. As the dryer rotates individual particles continually change position with respect to each other. The

free-falling, over-riding, cascading action does not break or deform the crystals. Variable speed is possible to permit blending operations prior to drying.—Patterson Foundry & Machine Co., East Liverpool, Ohio.

**Exchanger, Air-Cooled Heat**

Forced-draft type. (164D)

. . . More efficient cooling of liquids and gases at pressures up to 5,000 psi. and temperatures to 1,500 F. claimed for Fin-Fan air-cooled heat exchanger. Transaire sections keep tube-side pressure loss low due to smoother flow surfaces at nozzle and tube openings. Tubes spaced closer together for compactness. Tubes and tube spacers designed for easier field repairs and simpler tube replacement. Patented process for fin-to-tube bonding keeps fins rigidly in place despite repeated expansion and contraction. Transaire sections are self-draining.—The Fluor Corp., Los Angeles 22, Calif.

**Exchangers, Heat**

Simplified design for corrosive solutions. (164E)

. . . Exchangers now available from stock are aimed at providing economical units for corrosive service. Despite being fabricated from expensive corrosion-resistant materials they are

claimed to give low cost per sq. ft. Choice of materials includes tantalum, Karbate, stainless steels, nickel and black iron.—Carl Buck & Associates, Essex Fells, N. J.

**Exchanger, Heat**

For corrosive liquids or gases under pressure. (164F)

. . . Standard line of pressure heat exchangers designed to pass corrosive liquids or gases under pressure at high temperatures through tubes or shell is molded from Haveg, acid-digested asbestos bonded with synthetic resins. Advantages of line are extended service life and resistance to corrosion. Units are competitively priced. Allowable

pressures are from 50 to 75 psi. with wide margin of safety. Haveg material is resistant to thermal shock and can be used safely and continuously up to 265 F. Construction includes an outer shell, fixed and floating tube sheets 2½ in. thick, heads, baffles, impingement plates, all of Haveg.—Haveg Corp., Marshallton, Del.

**Exchanger, Plate Heat**

Low cost; press capacity up to 30 plates. (164G)

. . . Economical service model SI-30 plate-type heat exchanger designed for low capacity sells for much less than standard models of same type. Plates have knotted surfaces to create tur-

bulence and provide rapid heat transfer. Maximum press capacity is 30 plates. Over-all length is less than 3 ft., height is less than 5 ft.—Cherry-Burrell Corp., Chicago 6, Ill.

**Exchanger, Shell and Tube**

Non-fouling Pyrex brand glass and Teflon. (164H)

. . . Pyrex shell and tube heat exchanger does not contaminate products or undergo fouling of the surfaces. Reason is use of Pyrex brand glass and Teflon in construction of the unit. Interior of exchanger is completely visible. Fouling is detected early and removed

by recirculation of acid. Both shell and tube are designed for 20 psi. Maximum temperatures are 375 F. tube side and 200 F. shell side. Shell contains 26 tubes; tube wall coefficient is 260 Btu. per hr. per deg. F.—Corning Glass Works, Corning, N. Y.



**Exchanger, Standard Heat**

Made of graphite for  
100 psi. (165A)

... Standard heat exchanger has all wetted surfaces constructed of impervious graphite. Impervite 24-sq. ft. exchanger is stock item. There are no

gaskets to leak, all joints are cemented with resin. Upper temperature limit is 350 F.—*Falls Industries, Inc., Solon, Ohio.*

**Furnace, Tube**

For ultra-high range;  
reaches max. temperature  
in 2 hr. (165B)

... Water-cooled tube furnace can operate up to 5,000 F. Uses are foreseen in formation, fabrication or processing of ceramics and refractories. Even-temperature zone of furnace is 12 by 3 in. I.D. with full heated length of 26 in. Elements are water cooled and completely protected with fail-safe electrical interlocks. Power is continuously variable from 1 to 100% of connected load.—*Pereny Equipment Co., Columbus 12, Ohio.*

**Generator, Steam**

Two-pass design, 20 to  
500 hp. (165C)

... Automatic steam generator has two-pass design, eliminating need for refractory baffles or partitions in front or rear. There's easy and full access to all fire surfaces. All return tubes are arranged to do an equal amount of work. This improves uniformity of longitudinal expansion over entire

structure of pressure vessel. Flow of combustion air is governed to give controlled mixture of fuel and heated air. This creates a highly radiant flame with high rate of heat transfer. Lower stack-gas temperature is claimed.—*Continental Boiler Div., Boiler Engineering & Supply Co., Phoenixville, Pa.*

**Generator, Steam**

Compact; works on gas  
or oil. (165D)

... By flipping one switch Model OKJ-4740 steam generator is converted from oil to natural gas fuel. Working steam pressure up to 300 psi. can be developed from cold water in less

than 3 min. Generator makes 1,500 to 5,000 lb. steam per hr. Automatic controls modulate steam output to meet changing demand.—*Vapor Heating Corp., Chicago 23, Ill.*

**Heater, Air**

Unique burner, simple,  
compact. (165E)

... Low cost, compact heater is used with ovens, drying kilns, spray dryers, and similar process equipment where combustion products can be mixed with air being heated. Basic element is gas, oil or combination Thermal High Velocity Burner. Substantially all burning is completed within the burner body. Thus the heater is pri-

marily a mixing chamber where combustion products are mixed with the air being heated. Heater dimensions are custom fitted to the job. The same simple design is used for both high and low pressure heaters. Refractory normally is not used in the heater.—*Thermal Research & Engineering Corp., Conshohocken, Pa.*

**Heater, Drum**

Liquefies contents with-  
out overheating. (165F)

... Electric drum heater supplies uniform, gentle heat. It's particularly good where there is danger of overheating that might damage sensitive contents. Heater is constructed of alloy resistance wire. Insulation covers the wire

and an outer braid protects against wear. A blanket of fibrous glass can be used around heater and drum to speed heating. Power is furnished from 115-v. circuit.—*Pre-Fab Heater Co., Guilford, Conn.*

**Heater, Electric Immersion**

High output, capacities  
from 4 to 12 kw. (165G)

... Flanged, tubular electric immersion heater gives high heat output with capacities from 4 to 12 kw. Unit is designed for heating water, oil or paraffin. Unit's heating elements are available in two sheath materials. Type

TM-4 for water heating has cooper-sheathed elements brazed to a brass flange. Type TMO-4, for use in oil or paraffin, has steel-sheathed elements welded to a cast iron flange.—*Edwin L. Wiegand Co., Pittsburgh 8, Pa.*

**Heater, Industrial**

Floor, wall or ceiling  
mounted. (165H)

... Improved line of industrial heaters available for delivering large volumes of heated air to industrial plant areas. Self-contained unit may be floor, wall, or ceiling mounted. Capacities 100,000 to 2,500,000 Btu. per hr. and 2,000

to 25,000 cfm. Available accessories: filter boxes for built-in mechanical air cleaning and air-mixing boxes for controlled mixing of fresh and recirculated air.—*Westinghouse Sturtevant Div., Boston 36, Mass.*

**Heater, Plate-Type**

Fabricated of lead for  
low pressure. (165I)

... Lead plate-type heater for use with low-pressure steam is suitable for heating highly corrosive acids. Recommended for use with steam at 10 psi.

or less, these corrosion-resistant heaters are available in three standard sizes.—*Knapp Mills, Inc., Long Island City, New York.*

## HEATERS AND COOLERS . . .

### Heater, Radiant Infrared

Completely sealed and acid-proof. (166A)

... Far infrared radiant heat is emitted by electric heating element. This radiation has good uniformity, is readily absorbed by materials and substances being heated. Single heating unit is a nickel-alloy element encased in a fused

quartz tube. Unit is completely sealed and acid-proof. Each heating element has an individual stainless steel reflector. Capacities range from 100 to 1,000 w. per linear ft.—Cleveland Process Co., Cleveland 3, Ohio.

### Heater, Tank

Has serrated fins, needs less tubing. (166B)

... Laminar flow combatted by helically-wound serrated fins on horizontal tank heaters. Cal-Fin heaters available in two designs: Series IH when more than one heater per tank is required;

and Series MH for manhole installation. Heaters need  $\frac{1}{4}$  as much tubing as used in plain tube heaters or for internal pipe coils.—Drayer-Hanson, Inc., Los Angeles, Calif.

### Jacket, Heat Transfer

Boosts heat transfer rates. (166C)

... The Gross heat transfer insert or jacket provides flow channels to secure high flow velocities, better transfer rates and improved control. Design can be varied to give optimum efficiency. Jackets consist of flexible bag cores with flexible rubber ribs vulcanized to exterior surface. Complete assembly can be pushed into chamber. Ribs, pressing against wall to be heated or cooled, seal off channels to direct fluid flow. In most installations, ribs are designed to give spiral flow channels. Other patterns can be used. Steam pressures up to 20 psi. appear practical within limitations of rubber compounds now available.—Frank R. Gross, 592 Crestview Ave., Akron 20, Ohio.



### Switcher, Automatic Fuel

Eliminates fuel failures. (166D)

... Automatic fuel switcher assures uninterrupted operation of dual fuel diesels driving electric generators in event of gas failure. Control acts im-

mediately to furnish oil fuel to engine when gas pressure drops below a predetermined minimum.—Worthington Corp., Harrison, N. J.

### System, Fuel Changeover

Needs only 10 sec. or less. (166E)

... Recent development makes possible easy, fast changeover from gas to oil, or vice versa, in boiler firing. No mechanical or electrical change necessary. Proper circuit set in action by

flipping selector switch on control panel to either gas or oil. Turning fuel valves completes changeover in 10 sec. or less.—Cleaver-Brooks Co., Milwaukee 12, Wis.

### System, Over-Fire Air

Prevents smoke pollution of air. (166F)

... By teaming together a smoke detector, a blower and a set of air distribution nozzles, coal-fired furnaces can be operated without violating the smoke ordinances. Increased smoke density is detected by a photoelectric unit which actuates the blower. Air

delivered from the blower into the furnace permits more complete combustion and elimination of smoke. Recorder gives visual and permanent record of the operation; is firm proof of smoke-free operation. — Sterns-Flinn Corp., New York, N. Y.

### Trap, Steam

Vents air from system rapidly. (166G)

... Increased air venting capacity is claimed for the Heat-Kwik Super-Silver-top steam trap. This means faster heating, more production, lower steam consumption and longer trap life. Two separate orifices, one for condensate and the other for air, speed up the venting. When the trap is cold the air-bellows orifice is wide

open and handles large quantities of air very rapidly. After air is removed the bellows expands and closes the orifice. Thereafter, air leaves through vent hole in bucket. Working parts are heat-treated stainless steel; valve and seat are chrome alloy. Trap can be opened without removal.—V. D. Anderson Co., Cleveland 2, Ohio.

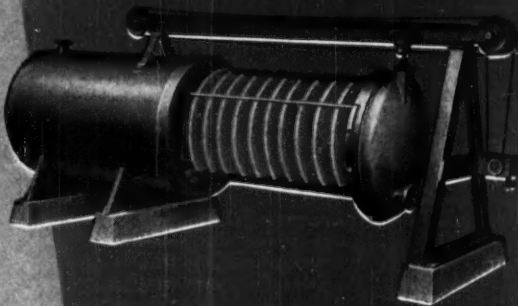
### Wheel, Ventilating

Acts as heat exchanger, can cool air. (166H)

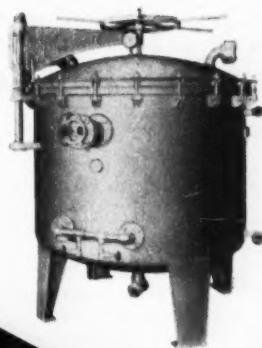
... Therm-O-Wheel, a wheel rotating in counterflowing air streams, transfers heat from one stream to the other. Up to 96% heat or cold generally lost through ventilation is recovered. Heat

transfer medium is metallic wool attached to framework of wheel. Wheel is equally effective cooling or heating incoming air.—Therm-O-Wheel, Inc., Far Rockaway, N. Y.

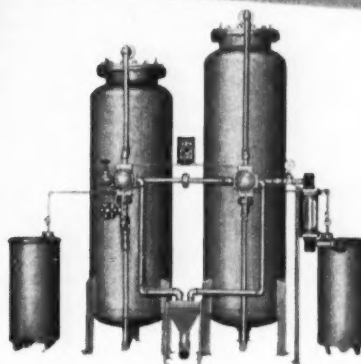
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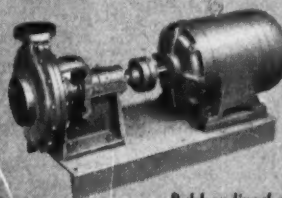
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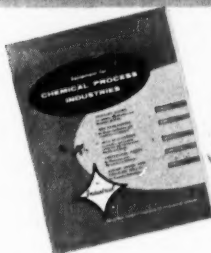
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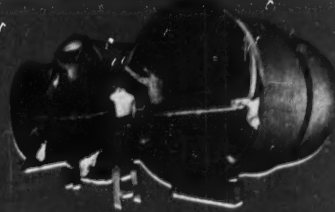
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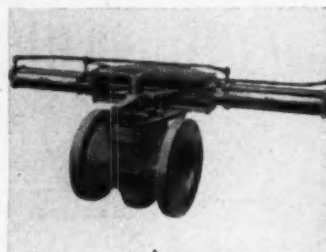
Tanks, pipe, and fittings are lined in our own plant with vulcanized rubber for corrosion prevention.

## • Instruments and Controls

### Actuators, Valve

Mount directly on valve; operated by air, gas, oil, water. (168A)

... Line of valve actuators designed for installation directly on valves in service, or valves at manufacturer's plants, or at distributors' warehouses. Actuators operate automatically to open or close gate, plug, diaphragm, butterfly, pulp stock or other flow control valves. They mount directly on valve without need of outside support. Actuators can be operated by air, gas, oil, water or steam.—Ledeer Mfg. Co., Los Angeles 15, Calif.



### Alarm, Combustible Gas

Samples stations on six separate locations. (168B)

... Model RV-6 indicating combustible-gas alarm system provides sequential sampling from six separate locations. Variations of model permit sampling potentially explosive atmospheres from two to eight locations. Unit draws samples continuously through metallic tubing and analyzes them point by

point on a thirty-second cycle. Detecting instrument is platinum-filament Wheatstone-bridge detection circuit. Presence of combustible gas is indicated on panel-mounted board. Red light and remote alarm give warning of dangerous concentration.—Johnson-Williams, Ltd., Palo Alto, Calif.

### Alarm, Flow

High and low signal with manometers or rotameters. (168C)

... Used with rotameters, manometers and similar process instruments the Flo-Gard offers unequalled range of sensitivity for signalling both high and low flow. It can operate accurately in conjunction with spherical floats as

small as  $\frac{1}{8}$  in., will detect 1 mm. of float position change. Fail-safe features of the Flo-Gard insure operation of the alarm in the event of power or component failure.—Brooks Rotameter Co., Lansdale, Pa.

### Ammeter, Micro-Micro

High accuracy independent of line voltage at low cost. (168D)

... High precision and stability are features of low-cost Model V Micro-microammeter. Instrument can be used for measuring, recording, controlling micro currents on order of one millionth of a millionth of an ampere. Practical application is for measuring effect of radioactivity on ion chambers

or similar devices—monitoring and controlling liquid levels, thickness of moving sheets and coatings. Basic unit is unique vibrating reed modulator sealed in glass envelope. Unit can be replaced as easily and inexpensively as vacuum tube.—Beckman Instruments, Inc., South Pasadena 1, Calif.

### Analyzer, Gas

Saves fuel cost, single compact unit. (168E)

... Maximum combustion efficiency, within equipment limitations, is assured through use of combination oxygen and combustibles analyzer. Unit acts as safety guide to prevent lighting off of unpurged gas-fired combustion

chambers. Single compact unit provides analyses of oxygen and combustibles. Minimum range: 0 to 5%. Accuracy within 0.2% by volume of  $O_2$  and combustible contents in sample.—Bailey Meter Co., Cleveland 10, Ohio.

### Analyzer, Gas

Employs beta radiation on binary mixtures. (168F)

... Binary gas mixtures are being continuously analyzed using the Radiological gas analyzer. Instrument uses strontium 90 as a source of beta radiation. This material is an abundant and inexpensive fission product. Ionization

of the gas by the beta radiation is basis for measurement. First installations have been used to measure argon in an ammonia plant. Standard and explosion-proof models are available.—Hallikainen Instruments, Berkeley, Calif.

### Analyzer, Gas

For traces. (168G)

... Super-sensitive gas analyzer can indicate gas concentrations as low as 5 parts per billion. Unit uses sensitive

method based on the detection of mercury vapor in ultraviolet light.—Taller & Cooper, Inc., Brooklyn 1, N. Y.

### Analyzer, Hydrogen

Operates continuously, accuracy within 0.5%. (168H)

... Continuous hydrogen analyzer measures gas concentration in hydrocarbon streams within 0.5% accuracy. Operation is based on catalytic oxidation of hydrogen in a thermally-isolated cell. Specific volume of hydrocarbons is withdrawn continually from recirculating stream and mixed with specific amount of air. Hydrocarbons are fil-

tered from mixture. Remaining hydrogen and air pass through heated block containing reaction cell. As oxidation of  $H_2$  occurs, temperature differential is detected and relayed to chart recorder or direct digital print-out system. Differential is measure of  $H_2$  concentration.—Taller & Cooper, Inc., Brooklyn 1, N. Y.



**Analyzer, Hydrogen**

Rapidly determines %  
H<sub>2</sub> and H/C ratio in  
liquid hydrocarbons.  
(169A)

... Time for control tests on H<sub>2</sub> and H/C ratio in liquid hydrocarbons has been slashed from 4 hr. to 5 min. with Beta Ray H/C meter. Source of beta rays is radioactive decay of strontium 90. Test is 100% more accurate than previous method. Performance of pilot model indicates statistical probable error of 0.02 weight % H<sub>2</sub> on individ-

ual samples as opposed to 0.05 weight % by previous combustion techniques. Corrections can be made to allow for presence of O<sub>2</sub>, H<sub>2</sub>, S, Pb, etc. Immediate applications of meter are predominantly in petroleum and petrochemicals. Safeguards in instrument fully protect operator from radiation.—Central Scientific Co., Chicago, Ill.

**Analyzer, Infrared**

For pilot plants, records  
infrared absorption.  
(169B)

... Model 14 multi-component infrared analyzer, designed for pilot plant use, continuously records infrared absorption at 6 different wave-lengths. Unit monitors concentration of as many as 6 components in liquid or gas stream. Model allows study of effect of such process variables as tempera-

ture, pressure, composition. Unit determines dependent and independent components under process stream conditions. In conventional lab analyses of batch samples, important compounds (existing only under stream conditions) are missed.—Perkin-Elmer Corp., Norwalk, Conn.

**Apparatus, Air Sedimentation**

For rapid, accurate meas-  
urement of particle size  
distribution. (169C)

... Micromerograph, air sedimentation apparatus, measures particle size distribution in as little as 15 min. Normal range of operation is 1 to 100 microns mean particle diameter. Three percent accuracy throughout range. Reliability based on ability to completely deagglomerate individual particles of any sample. Unit places analysis on more direct theoretical basis with

simple operating techniques and calculations. For any new material complete reproducibility can be assured by a few short trials that establish correct operating conditions. Among the powdered materials measured are cements, pigments, metal powders, abrasives, ceramics, fluid catalysts, drugs, insecticides and cosmetics.—Sharples Corp., Bridgeport, Pa.

**Cable, Instrument Tubing**

Saves money on long  
runs. (169D)

... Armored Multitube offers substantial savings on moderate to long runs of instrument tubing. Cable is used where a number of tubes  $\frac{1}{2}$  in. or smaller are needed. Multitube contains from 2 to 19 tubes within a flexible interlocked galvanized steel armor. Tubes are twisted together to

permit bending without distortion. One tube in each layer is bright blue. This permits easy identification of each tube at both ends of cable. Continuous lengths are furnished up to 1,000 ft. Also available in polyethylene and other plastics.—Crescent Insulated Wire & Cable Co., Trenton, N. J.

**Calibrator**

Medium pressure, checks  
instruments. (169E)

... Pneumatic calibrator tests and calibrates medium-pressure instruments. It works with instruments operating between 20 in. of water and 25 psi.

Unit operates from 35 psi. air source. It's fully portable; can be used in field and shop.—Republic Flow Meter Co., Chicago 47, Ill.

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Then you should be able to spot it in this Inventory Issue. You'll find it a unique and helpful reference to major developments within the past twelve months in new plants and facilities, processes and tech-

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## INSTRUMENTS AND CONTROLS . . .

**Cell, Pressure**

Sensitive, accurate, wide range. (170A)

. . . Transducer Dynaformer pressure cell gives highly accurate pressure measurement. Element converts fluid pressure to proportional a.c. voltage. Elec-

tronic resistance Dynalog instrument measures voltage in terms of pressure. Cell's accurate within  $\pm 4\%$ .—The Foxboro Co., Foxboro, Mass.

**Cells, Strain Gage Load**

Increased precision, interchangeable. (170B)

. . . Two series of precision and extra-precision Type SR-4 load cells measure force and weights. Compression cells are available in nine capacities from

500 to 200,000 lb.; tension load cells are furnished in eight capacities from 500 to 100,000 lb.—Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

**Cells, Strain Gage Pressure**

High-frequency response, long fatigue life. (170C)

. . . SR-4 type HF strain gage pressure cells give high-frequency response to pressure variations. They're ruggedly constructed and have exceptionally high accuracy and sensitivity. Pressure changes are measured by an electrical indicator or potentiometer recorder. However, cell usually is connected to an oscilloscope or oscillograph for high-frequency response. Temperature compensation is provided over wide range to prevent changes of zero and sensitivity (output).—Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

**Component, Computer**

Saves space and time by new concept. (170D)

. . . As a vital link in automatic process control a new computer element occupies a mere fraction of the space of its predecessors; operates five times as fast; can subtract, multiply, divide, integrate and perform basic operations of vector algebra and vector calculus. It connects the sensing instruments

with motor equipment that carries out orders. Entering electrical signals are converted to heat. After some automatic arithmetic from built-in circuitry this heat is converted into electrical order signals to direct the motor equipment.—Arma Corp., Garden City, N. Y.

**Control, Flame Failure**

Also provides programming. (170E)

. . . Control for gas, oil or combination gas-oil burners combines flame-failure safeguard and programming control. Single unit gives complete automatic startup, operating and shutdown

control for any type burner. Included in Fireye control is a flame-sensitive Firetron cell that shuts off fuel 2-4 sec. after flame goes out.—Combustion Control Corp., Boston 15, Mass.

**Control, Level**

Electronic, no moving parts. (170F)

. . . Tektor level control operates by a change in electrical capacitance with the approach of any material that flows. Instrument provides control of

level within  $\frac{1}{8}$  in. Models 101 and 102 use only one radio tube.—Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.

**Control, Speed**

Governs rotary speed precisely. (170G)

. . . Rotary speed can be controlled automatically and precisely through use of the KC-223 mechanical electric translator. It measures only  $2\frac{1}{2}$  in. in dia. by  $4\frac{1}{2}$  in. high yet is accurate within 2% from 1,200 to 5,000 rpm. Translator operates satisfactorily in any

mounting position. Two models available: the first will open or close any desired electric circuit at a predetermined rpm.; the other is a multi-speed instrument for controlling automatically a sequence of operations.—Kahn & Co., Inc., Hartford 1, Conn.

**Controller, Temperature**

Combination cutoff and automatic hold type. (170H)

. . . Model 505 Cyber-Tac controller is contact-type instrument used in conjunction with an electronic circuit. Instrument is combination cutoff and automatic hold type controller with thermocouple break protection. Ex-

haustive tests have shown unit capable of maintaining temperature control to an accuracy of 2% of full range. Performance holds for over one million contact cycles.—Cybertronic Corp. of America, Upland, Chester, Pa.

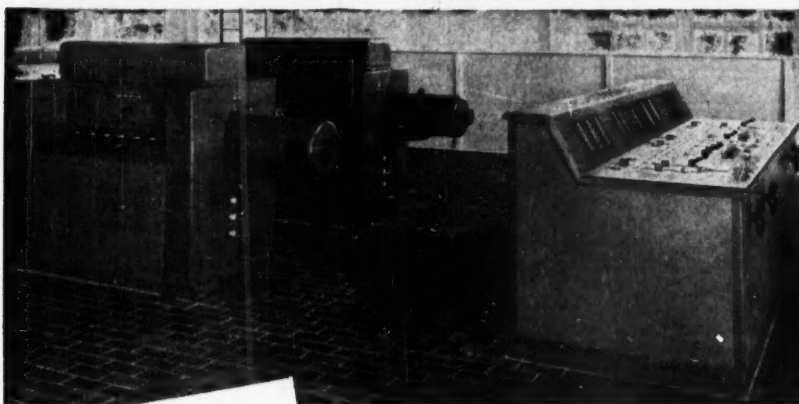
**Control, Temperature**

Low cost, covers several ranges. (170I)

. . . Precision temperature control covers three ranges from  $-100$  to  $+600$  F. Red and green signal lights indicate temperature is above or below set point. Control options are on-off,

two-position, floating, proportioning depending upon the selection of final control element.—Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia 44, Pa.

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**Electrolytic  
Processes**

with the  
**COMPLETELY  
COMPENSATED**

These two Brown Boveri mechanical rectifiers were installed in 1950 in an aluminum plant. They were each rated 10,000 Amps D.C. at 140-250 Volts D.C. Due to accumulated experience and design refinements, similar units are now capable of carrying 20,000 Amps D.C. . . . resulting in appreciably lower first-cost.

## BROWN BOVERI MECHANICAL RECTIFIER

**P**RACTICAL experience of over 10 years in aluminum, chlorine and other electro-chemical plants throughout the world has clearly demonstrated the outstanding qualities and overall economy of the fully compensated Brown Boveri mechanical rectifier for 60 or 50 cycles operation:

The excellent operating performance of Brown Boveri mechanical rectifiers is due to the application of the following design principles:

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- 2—Relieving main contacts of any switching duty by means of a thyatron shunt circuit and auxiliary magnetization of the commutating reactors.
- 3—Automatic timing of the commutation period resulting in stable operation under any load conditions regardless of supply voltage fluctuations.

All of the above features result in practical immunity of these rectifiers to arc-backs from all causes, low contact wear, low maintenance and correspondingly low service costs.

Easy to install, requiring little space, Brown Boveri Mechanical Rectifiers are proving to be quickly self-liquidating investments — the direct result of substantial power savings and uninterrupted operation. It will pay you to get ALL the facts.

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(at 280 Volts)  
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a Year!**

**MINIMUM  
MAINTENANCE**

**Practically no  
contact wear  
after 7,800 hours**

An inspection of the contacts in the above equipment — made after 7,800 hours of continuous service — showed them to be in very good condition. They were returned to service for **thousands of additional hours of "round-the-clock" operation.**

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**INSTRUMENTS AND CONTROLS . . .**

**Controller, Liquid Level**

Reacts to capacity change. (172A)

. . . Electronic level controller detects level of liquid, foam, liquid-liquid interfaces, viscous fluids or granular solids. Controller reacts to change in capacity when probe is covered by liquid or other flowable material.

Capacity change causes radio frequency oscillator to reduce or completely stop its oscillation. Capacity change generates d.c. voltage signal. Amplification of signal operates relay to control flow.—*Instruments, Inc., Tulsa, Okla.*

**Controller, Pneumatic**

Three modes of control. (172B)

. . . Miniature pneumatic-balance controller uses three modes of control. Rate action has been added to adjustable, proportional band response and

automatic reset action. Controller permits faster, closer batch control.—*Minneapolis-Honeywell Regulator Co., Industrial Division, Philadelphia, Pa.*

**Controller, Flowmeter**

Covers wide flow rates, accurate. (172C)

. . . Differential controller operates orifice-meter measuring stations where flow conditions vary widely. Controller automatically turns an additional measuring unit into the line when flow is

high, and shuts it off completely as flow drops off. This procedure provides accurate rate measurement over a wide flow range.—*Rockwell Mfg. Co., Pittsburgh 8, Pa.*

**Controller, Vacuum**

Holds vacuum system within limits. (172D)

. . . Industrial vacuum systems in the range between 1 and 1,000 microns can be held automatically within any preset limits through use of a new indicator-controller. Unit provides upper and lower limit control and

automatic reset. Typical industrial application is for control of a vacuum pump to maintain vacuum within desired limits. It can run alarm when vacuum moves near limits.—*Hastings Instrument Co., Inc., Hampton, Va.*

**Controllers, Electronic**

Wide range, use standard measuring elements. (172E)

. . . Free-Vane electronic controllers have been added to series 500. Instruments come as indicating or recording controllers for temperature, pressure, flow, liquid level, humidity and time program control. Free-Vane instru-

ments are for low-open, high-open, low-high, low-open-high or low-normal-high control; also for proportional input control. Unique frequency modulation is key.—*The Bristol Co., Waterbury 20, Conn.*

**Controls, Packaged**

Simplify selection for industrial processes. (172F)

. . . Individually-engineered control systems furnished as package units permit selection of an instrumentation system on the basis of over-all function. Units have been developed to take advantage of uniformity among many process operations. For example, batch cooking operations are basically the

same in textile, chemical, food industries. Each unit includes recording and controlling instruments, measuring and control instruments and related accessories. You no longer need consider individual elements.—*Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia 44, Pa.*

**Controls, Process**

Fully electronic, measure and control. (172G)

. . . Complete line of electronic instruments permits installation of completely electronic process control system. System is most efficient for measuring and controlling temperature, pressure, differential pressure, liquid level and flow. Virtually no lag in transmission signal. Accurate and de-

pendable signal permits installation of all controllers in control room regardless of distance from process area. Control components are standardized to allow interchange, regardless of type of variable under control.—*Manning, Maxwell & Moore, Inc., Stratford, Conn.*

**Converter, Differential**

Consumes less air, unaffected by supply variations. (172H)

. . . Differential converter, for precise measurement of process flow, uses only one-sixth as much air as conventional nozzle-pressure transmitters. Incorporation of a pilot relay transmitter reduces air consumption. Instrument is virtually unaffected by variations in air supply, but is highly responsive to

flow change. Compact instrument can be mounted right on pipeline close to pressure taps. Meter bodies can stand temperatures to 350 F.; the transmitter can withstand up to 225 F. No mercury is used so there's no contamination.—*Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa.*

**Detector, Holiday**

Portable unit for pipe and tank coatings. (172I)

. . . Holidays in pipe and tank coatings easily detected with SPI holiday detector Model #200. Location of holiday is spotted by a spark which operator sees and hears. Signal remains in action several seconds, is controlled by small cathode gas-filled tube capable

of instant action. Power circuit designed to give higher output with smaller current drain on batteries. Battery charger supplied with each detector is heavy duty 6 amp., 110 v. unit.—*Standard Pipe Protection, Inc., St. Louis 17, Mo.*



**Detector, Hydrogen Sulfide**

Detects and measures continuously and accurately. (173A)

... For positive control of processes and protection of personnel the type SU detector monitors concentration of hydrogen sulfide gas continuously and automatically. Full scale ranges can be set from 0.25 to 200 parts per million. Two basic steps produce measurement

of concentration. First a series of stains are produced on a test strip of paper. Each stain is related in density to the concentration of  $H_2S$  in the gas passed through the strip. Density then is compared to unstained strip.—Viking Instruments, Inc., East Haddam, Conn.

**Detector, Metal**

Electronic. (173B)

... Metal detector operates electronically to detect any kind of metal or alloys, magnetic or non-magnetic.

When detected, instrument can sound warning, or stop conveyor belt.—Radio Corp. of America, Camden, N. J.

**Detector, Odor**

Measures odor intensities. (173C)

... Osmometer odor-detecting instrument evaluates odor intensities with variations from 0 to 300. Can be used to establish processing standards and for

quality control. Unit is effective for perfumes, essential oils, aromatics and masking agents.—Odor Instruments, Inc., New York, N. Y.

**Detector, Portable Gas**

For traces of gas in air. (173D)

... Minute amounts of gas in air can be measured with portable gas detector. Based on the absorption of ultraviolet light the unit will detect only a few

parts per billion. This is less than 1/20 the toxic concentration for many substances.—Manufacturers Engineering & Equipment Corp., Hatboro, Pa.

**Detector, Radiation**

Alpha sources in clothing. (173E)

... Radiation detector locates sources of alpha contamination in clothing. When alpha Poppy detector is passed over contaminated area either an audible popping noise or a visual signal is produced. Alpha rays pass through

thin aluminum foil which excludes light. These alpha rays are caught by a zinc sulfide screen that converts their energy into light. The light is converted into electrical impulses.—General Electric Co., Schenectady, N. Y.

**Detector, Radiation**

Guards personnel, fits into pocket. (173F)

... Light-weight, Norelco radiation detector readily locates sources of beta and gamma radiation. The PW 4010 instrument weighs only 25 oz. and measures 1.7 x 6.6 in. Special circuit draws from the anode batteries only when the geiger tube registers counts. This feature greatly prolongs the life of the anode battery. Detector can be used for X-ray monitoring, locating lost radioactive materials, guiding persons in contaminated areas, measuring radiation exposure of workers and checking intensity levels during research investigations.—North American Philips Co., Inc., Mount Vernon, N. Y.

**Detector, Smoke**

Gives warning when power fails. (173G)

... Modified smoke detection equipment gives warning when there is a power failure. Thus there is always assurance that the important job of automatic smoke and fire detection will never halt. With power-failure alarm system the unprotected condition is

revealed immediately. A 6-v. battery-powered device causes an audible alarm to sound. With this warning, power failure can be corrected promptly and the failure-alarm returned to its guarding function.—Walter Kidde & Co., Inc., Belleville, N. J.

**Drive, Two-Speed Chart**

Details process trouble. (173H)

... Two-speed chart drive details record of process trouble. When a variable exceeds predetermined limits, chart speed instantly increases to 30 or 60 times normal rate. When normal conditions return, chart speed drops to usual pace. Mechanism designed for

use in Honeywell's single-record strip-chart instruments. Manual switch permits speed changes for precise charting of new process tests or whenever more open, legible record is needed.—Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa.

**Gage, Level**

For LP gas and ammonia. (173I)

... Liquid level in LP gas or anhydrous ammonia storage tanks indicated by 3190 Series gages. Gages suitable for installation in mobile tanks where they're likely to undergo rough treat-

ment. Special features include: stainless steel head plates, interchangeable snap-on dial chamber, adjustable tubular-steel support members.—Rochester Mfg. Co., Rochester 10, N. Y.

## INSTRUMENTS AND CONTROLS . . .

### Gage, Molecular Vacuum

Comes as integral unit.  
(174A)

. . . Detectors and gage are combined in a common housing in molecular vacuum gage. Instrument is designed for panel mounting and connection to vacuum system by suitable piping. It covers range from 0 to 20 mm. dry

air. Instrument is available in two types, identical except for scale marking. One is calibrated directly for dry air; the other has linear scale for individual calibration.—General Electric Co., Schenectady 5, N. Y.

### Gage, Remote-Reading

Permits full 180-deg. visibility.  
(174B)

. . . Convex scale remote-reading gage permits full 180-deg. visibility from any point where the gage cover can be seen. Compensated manometric gage meets new interpretation of the boiler

code for WSP of 900 psi. or higher. Liquid levels in boilers, tanks, etc., can be read with accuracy of  $\pm 1\%$  of scale reading.—Jerguson Gage & Valve Co., Somerville, Mass.

### Gage, Vacuum

Has increased range and accuracy.  
(174C)

. . . Increased range has been incorporated into Type 511 Alphatron vacuum gage. Linear indications of total pressure are provided between 1,000 and  $10^{-4}$  mm. Gage employs a shielded radioactive source rather than the conventional hot filament. Ionization current measured by d.c. amplifier

calibrated to give absolute pressure in mm. of mercury. Batteries eliminate trouble from fluctuating power supply. Instantaneous response to pressure changes makes gage useful as leak detector. Unit attached to vacuum system by  $\frac{1}{4}$ -in. pipe thread.—National Research Corp., Cambridge, Mass.

### Gage, Vacuum

Serves five indicators, range 1 to 1,000 microns Hg.  
(174D)

. . . Incorporation of a switching unit enables Hastings vacuum gage to monitor as many as five positions in a vacuum system. Vacuum pickup indicators may be widely separated from the centrally located gage. Continuous readings

are made without affecting pressure in system. Gage has noble metal thermocouples and nickel-plated gage tubes. Outgassing, contamination and corrosion are eliminated.—Hastings Instrument Co., Hampton, Va.

### Indicator, Liquid Level

Uses ultrasonic pulse to gage level.  
(174E)

. . . Liquid levels can be gaged within  $\pm 0.01$  ft. using ultrasonic pulse ranging technique. Model SL-101 liquid-level indicator system also is suitable for precise location of demarcation line

between immiscible liquids. Self-contained calibration system automatically compensates for changes in variables. Actual gaging is by transducer.—Bogue Electric Mfg. Co., Paterson 3, N. J.

### Indicator, Moving Scale

Increases reading accuracy, for use with any primary instrument.  
(174F)

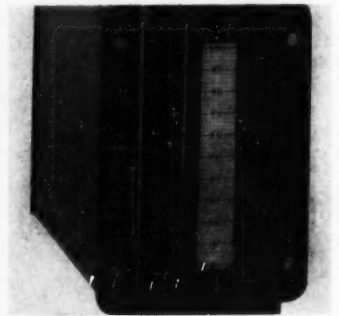
. . . Moving strip-scale behind fixed horizontal hairline is used on remote indicating device to give increased reading accuracy. Separation between scale and hairline is very small. This combined with eye-level reading virtually

eliminates problem of parallax. Total scale length is 72 in. Accuracy is better than one part in two thousand; scale divisions are  $\frac{1}{8}$  in. apart; scale can be calibrated in any desired units.—Fischer & Porter Co., Hatboro, Pa.

### Indicator, Ribbon Type

Fits graphic panel, indicates valve position, liquid level.  
(174G)

. . . Ribbon type indicating receiver available for graphic panel use. Model 50 Consotrol indicator gives continuous indication of valve position or variables such as liquid level. Indicator receives pneumatic measurements from transmitter located at process. Force is applied to receiver bellows. Lever and stainless-steel tape arrangement actuated by bellows rotates two lightweight drums. Brightly colored nylon tape wound on drums is drawn behind glass panel on which graduations are indicated.—The Foxboro Co., Foxboro, Mass.



### Instrument Differential

No mercury.  
(174H)

. . . Differential pressure instrument actuated by metal bellows gives accurate measurement without use of mercury

manometer. Operates up to 1,000 psi. in ranges of 20, 50, 100, 200 in.—American Meter Co., New York, N. Y.

### Instrument, Dust-Measuring

For sampling.  
(174I)

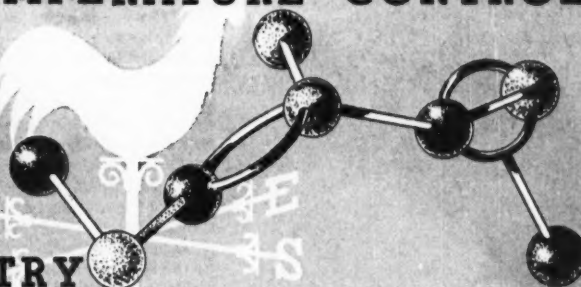
. . . Line of dust measuring instruments, manufactured in England, is available in the U. S. Four different

units sample air-borne dust and bacteria.—Mine Safety Appliances Co., Pittsburgh 8, Pa.

# ATMOSPHERIC TEMPERATURE CONTROL

by **Marlo**

for the  
**CHEMICAL INDUSTRY**

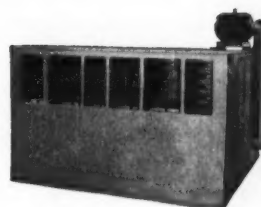


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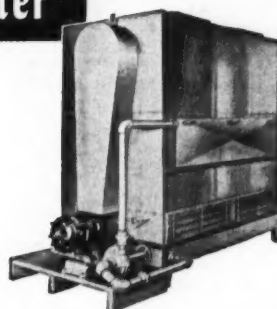


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For 3 to 100 tons nominal capacity for any refrigerant. Small, compact, lightweight, adaptable to indoor or outdoor installation. Protected four ways against corrosion. Save up to 95% of normal water demand.



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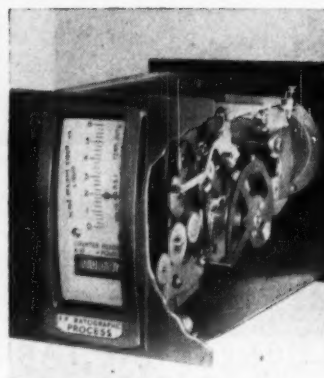
CITY.....ZONE.....STATE.....

## INSTRUMENTS AND CONTROLS . . .

**Integrator-Indicator**

Miniature graphic, full size mechanism. (176A)

. . . Designed primarily for mounting in graphic panels, miniature integrator-indicator incorporates full-size integrating mechanism and standard five-digit counter. Unit measures 6 x 6 x 14½ in.; indicates instantaneous rate and continuously integrates measured variable. High-speed integrating unit senses and totals flow rate of measured liquid or gas every 2.5 seconds. Instantaneous flow rate is indicated on a vertical strip by a pointer attached to the integrator calibration cam. Unit can be combined with an impulse type counter to operate shutoff or other end-point control devices after a certain flow has been measured.—Fischer & Porter Co., Hatboro, Pa.

**Meter, Electronic Flow**

Uses mercury-less transmitters. (176B)

. . . Electronic flowmeter makes use of mercury-less bellows transmitter for indicating and recording fluid flow. Used with a continuous type mechanical in-

tegrator, instrument measures flow of steam and water, as well as other fluids and gases.—The Hays Corp., Michigan City, Ind.

**Meter, Flow**

Induced voltage measures flow rate. (176C)

. . . Xactronic meter measures flow rate of aqueous conductive liquids having resistivities of 10<sup>3</sup> ohm-centimeters or less. Accuracy is ±1% of full-scale

reading. Charges in liquid viscosity, density, turbulence, temperature or line voltage have no effect on degree of accuracy.—Bowser, Inc., Wayne, Ind.

**Meter, Flow**

Uses force balance, meters hazardous fluids with safety. (176D)

. . . Flovane meter uses pneumatic force, balanced against thrust of moving fluid on a circular vane, to measure flow. Fluid that is being metered never leaves the pipe. Normally haz-

ardous fluids can be metered with safety. Flovane is explosion-proof. It can be used to measure pressures from 0 to 3,000 psi.—Link Engineering Co., Flovane Div., Detroit 27, Mich.

**Meter, Indicating Flow**

Indicates and alarms. (176E)

. . . Indicating flowmeter installed right in the pipeline tells at a glance the liquid flow rate. Construction is simple and rugged, has only three moving parts. Desired flow rate can be set

quickly on the face of the switch. Flow is indicated on a dial. When flow is above or below the set rate a Mercoid switch actuates an alarm system.—Henzey Co., Watertown, Wis.

**Meter, Industrial pH**

For panel mounting, services easily. (176F)

. . . Use of plug-in circuits enables non-specialists to repair a new type industrial pH meter within minutes. Designed for panel mounting the compact meter accommodates any combination of recorder or meter ranges. The pH scale can be shifted up or down, ex-

panded or compressed. Instrument uses standard glass pH electrodes, potentiometric recording and controlling equipment and external indication meters; has eye-appealing appearance.—Beckman Instrument Inc., South Pasadena, Calif.

**Meter, Kilovolt**

Shows variation down to 0.05%. (176G)

. . . Kilovoltmeter measures not only voltage but also percent voltage variations. Meter measures voltages from 0-60 kv. in three ranges. 0-1,200-v., 0-30 kv., 0-60 kv. Meter's sensitivity is 20,000 ohms per volt for 0-1,200-v.

range; 25 to 50 microamps full scale for the 30 kv. and 60 kv. ranges respectively. Accuracy for kv. ranges and percentage readings is 3%; in the 0-1,200-v. range it's 2%.—Neutronic Associates, Elmhurst 73, N. Y.

**Meter, Mass Flow**

Gyroscopic precession gives accurate mass-rate readings. (176H)

. . . Cyro flowmeter incorporates gyroscopic precession to give true mass flow rate metering. Outstanding features are: (1) direct sensing of weight flow of gases, liquids, gas-liquid mixtures without intermediate corrections; (2) measurement of fluidized solids, liquids or gases containing limited

amounts of suspended solids; (3) metering of any pumpable material without interference from temperature, pressure or viscosity; (4) operation on remote location without amplifications. Meter accuracy is consistently within 4%.—Control Engineering Corp., Norwood, Mass.

**Meter, Mass Flow**

For free-flowing dry solids. (176I)

. . . Mass flow rates for free-flowing dry solids are given by the Massometer. Accuracy: within 1% from 10 to 100% of capacity. Massometer measures mass flow rate by determining the torque produced in accelerating flow. Torque is measured by a pneumatic relay op-

erating on the "flapper and nozzle" principle. Output of the relay is proportional to material flow and is measured by a conventional circular-chart pressure recorder. Recorder can be provided with an integrator.—Wallace & Tiernan, Belleville, N. J.



**Meier, Moisture**

Gives fast results, 2% accuracy when properly calibrated. (177A)

... Surface moisture content on solid particles is determined rapidly and accurately with Olivo moisture meter. Weighed sample is hermetically sealed into instrument with glass capsule of calcium carbide. Vigorous shaking breaks capsule, mixes contents with sample. Reaction between  $\text{CaC}_2$  and sample moisture produces acetylene gas. Pressure exerted by the gas on inner walls of chamber is recorded on Olivo meter in terms of percent surface moisture.—Heyl & Patterson, Inc., Pittsburgh 22, Pa.

**Meters, for Foam Trucks**

Proportion foam mixture. (177B)

... Fire-fighting foam truck, now equipped with suitable flow meters, delivers correct foam concentration at all times. For proper proportioning, operator turns valve in liquid foam line until that flow meter indicator is at

same height as indicator of water flow meter. When indicator levels match, foam liquid adds to water in correct proportion, regardless of the amount of water being pumped.—National Foam System, Inc., West Chester, Pa.

**Monitor, Air-Flow**

Heat-sensitive warning device. (177C)

... Detect-A-Flo, precision flow-detecting device, senses and responds to changes or stoppages in air flow. Unit is used as warning device in air-cooled equipment and ventilation controls. Also used as level controller in tanks.

On air flow, sensitivity is less than 0.25 ft. per sec. at low flow and less than 1 ft. per sec. at higher flows. On liquid-level detection, unit responds to changes of less than 0.1 in.—Fenwal, Inc., Ashland, Mass.

**Operator, Plug Valve**

For refineries, closes valve in 2 sec. (177D)

... Plug valve operator closes 24-in. plug valve in 2 sec. without mechanical shock. Units available for valves from 1½ to 30 in. Operator can be gas, air or liquid powered at pressures from 60 to 1,000 psi. Unit is available

for manual, cyclic or automatic remote control with pneumatic, hydraulic, or electric initiation. Power and easy control make it adaptable in refineries and industrial plants.—Shafer Valve Co., Inc., Mansfield, Ohio.

**Photomultiplier**

Hikes sensitivity of spectrophotometer. (177E)

... Photomultiplier attachment for Model B spectrophotometer gives many-fold increase in sensitivity. Attachment permits measurement of low

light levels in transmission and reflectance work; is used in 320 to 600 millimicron range.—Beckman Instruments, Inc., South Pasadena, Calif.

**Pickup, Pressure**

Water-cooled, stainless steel parts. (177F)

... Dynamic pressures at extremely high temperatures measured with water-cooled pressure pickup. Instrument uses same type catenary diaphragm and cylindrical restraint element as found in Norwood controls line of EP pressure pickup instruments.

Heat transfer rate for entire face of unit is 11 Btu. per sq. in. per sec., with cooling water temperature rise of 85 F. Since exposed parts are of stainless steel, pickup can be exposed to highly oxidizing conditions.—Control Engineering Corp., Norwood, Mass.

**Potentiometer, Recording**

For time-temperature program control. (177G)

... Dynamaster recording potentiometers are available as time-temperature program controllers. Instruments regulate temperature according to predetermined schedule of changing values.

Any number of different temperature programs can be maintained by controller. Instruments employ electronic control system.—The Bristol Co., Waterbury 20, Conn.

**Pyrometer, Pocket**

In shock-absorbing case, 2% accuracy. (177H)

... Shock-absorbing rubber case protects built-in precision of Series 240-T pocket pyrometer. Instrument gives quick accurate measurement of surface and sub-surface temperatures. It has accuracy of plus or minus 2% of full

scale deflection for any temperature from 0 to 2,500 F. Cold end compensating thermometer indicates temperature change at cold junction of the thermocouple.—Cybertronic Corporation of America, Upland, Chester, Pa.

**Recorder, Analog Data**

Widely versatile, prints digits. (177I)

... Ametron recorder prints virtually any physical quantity capable of being converted into a corresponding voltage. It can operate remotely. Instrument can be switched from one sensing de-

vice to another to print data. Among sensing devices used with recorder are tachometer generators, thermocouples, load cells and pressure cells.—Streeter-Amet Co., Chicago 13, Ill.

## INSTRUMENTS AND CONTROLS . . .

**Recorder-Controller**

Economical and flexible.  
(178A)

. . . Low first cost, low operating and maintenance cost and maximum flexibility are claimed for line of recorder-controllers. Instruments can record and control temperature, conductivity, strain, force, position, pressure and can

be used for telemetering. Instrument contains four interchangeable units; operates on the null-balance principle, using a.c. signal actuation.—*Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia 53, Pa.*

**Recorder, Miniature**

Receives four variables.  
(178B)

. . . Ratographic recorder, designed for standard graphic or semi-graphic panel mounting, can receive four variables instead of conventional three. Instru-

ment can record two variables and indicate two more or record three variables and indicate the fourth.—*Fischer & Porter Co., Hatboro, Pa.*

**Recorder, Operational**

Seven-day cycle, full chart visibility. (178C)

. . . Unattended equipment can be monitored for a seven-day period by Operational Recorder. Instrument is compact, simple, has full chart visibility. Recorder traces continuous rec-

ord on pressure-sensitive paper chart for seven day period. Three-position metal stylus indicates variables as well as deviations from the norm.—*Libroscope, Inc., Glendale, Calif.*

**Recorder, Pneumatic**

Requires less service,  
fewer adjustments. (178D)

. . . Metagraphic pneumatic transmission instruments are designed for measuring, indicating, recording and controlling pressure, temperature, vacuum, flow, differential pressure and liquid

level. Range changes can be made in seconds. All components are interchangeable. Units can be combined to make any desired arrangement.—*The Bristol Co., Waterbury 20, Conn.*

**Recorders, Multi-Point**

Lower recording costs,  
also can act as single-point recorders. (178E)

. . . Economical recording and controlling are available through two multi-point recorders. These circular chart instruments are furnished for either 6-point or 24-point recording. Each unit is equipped with a 6-point turret pen to provide six different colored traces. The full cycle for 6 points on the standard unit is accomplished within 30 sec. On 24-point recorders there's a combination of 6-point and segmental recording. The 24-point cycle on standard unit is accomplished in two min.—*Fielden Instrument Div. Robertshaw-Fulton Controls Co., Philadelphia 33, Pa.*

**Regulator, Flow**

Holds preset rate as pressure varies. (178F)

. . . Flow control without use of expensive equipment is provided by low-cost flow regulator. Device maintains a preset flow rate despite changes in upstream or downstream pressures.

Regulator senses differential pressure and holds it constant to maintain a constant flow rate. Unit is available for flow ranges from 6 to 80 gpm.—*Fischer & Porter Co., Hatboro, Pa.*

**Regulator, Flow Rate**

Controls light slurries,  
is self-cleaning. (178G)

. . . Regulator controls flow rate of light slurries as well as clear liquid. Direct-acting unit holds constant rate despite fluctuation in either inlet or

outlet pressure. Downflow design prevents stoppage. Will drain completely when piping system is drained.—*W. A. Kates Co., Deerfield, Ill.*

**Regulator, Pressure**

Faster, gives closer control. (178H)

. . . Thomas Magna-Stoke makes possible closer regulation of fluid flow. This new valve uses a gear train with a 2 to 1 ratio, giving twice the stroke

at the inner valve as at the diaphragm. Net effect: more sensitive response to pressure fluctuations.—*Natural Gas Equipment, Inc., Pasadena 2, Calif.*

**Refractometer, Production**

Tank mounted, measures solids content of liquids. (178I)

. . . Liquids in tanks can be checked continuously for dry solids content with O. P. L. production refractometer. Unit can be mounted permanently so that it projects through tank wall into liquid. Light source, by which index of refraction is measured, is an electric

bulb. Image of a line, separating area of transmitted light from that of reflected light, is projected onto ground glass screen outside the tank. Mobile pointer moves over scale to show liquid composition inside tank.—*E. J. Van Der Leur, New York 4, N. Y.*

10 years of research ... over 75 years of pump manufacturing experience ...



**A. POSITIVE DISPLACEMENT METERING**

... plus

**B. NO FRICTIONAL PARTS IN LIQUID END**

... plus

**C. CONTINUOUS FLOW CHARACTERISTICS**

The **Hills-McCannameter**—"the meter that pumps"—establishes an entirely new set of standards for precision, accuracy and reliability in small volume metering and proportioning.

**SPECIFICATIONS—Series "A"**

Effective capacity range: 5 c.c. to 6 gal. per hr.  
Standard pressure range: to 2500 psi (special designs to 10,000 psi).

If you have been looking for a pump that will precisely meter a wide output range of small volume flows, here is the answer. Write today. HILLS-McCANNA CO., 2341 W. Nelson St., Chicago 18, Illinois.

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- ✓ Stepless volume control
- ✓ Automatic vapor venting
- ✓ Downhill\* metering

\*From high suction to lower discharge pressure.

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*metering and proportioning pumps*

Also Manufacturers of

SAUNDERS PATENT DIAPHRAGM VALVES • FORCE FEED LUBRICATORS • MAGNESIUM ALLOY SAND CASTINGS

## INSTRUMENTS AND CONTROLS . . .

**Regulator, Temperature**

Large size, self-operating,  
for 25 to 275 F.  
(180A)

. . . Additions to Stacon line of self-operating temperature regulators are Type V 1000 direct-acting for heating applications and VR 1000 reverse acting for cooling. Compact, self-con-

tained, pilot-operated regulators have simple design; employ liquid expansion principle. Units designed for maximum pressure of 125 psig.—Farris Stacon Corp., Palisades Park, N. J.

**Relay, Vibration**

Guards rotating equipment, 300 to 18,000 rpm.  
(180B)

. . . Protective device warns immediately of excessive vibration in heavy rotating parts. It can be used to guard turbine or water-wheel generators, large motors, blowers, steam or gas turbines and centrifuges. Relay can

energize warning-alarm, corrective, or shut-down devices at pre-set vibration acceleration values to 20 g. Built-in fail-safe feature gives warning in case of relay failure.—General Electric Co., Schenectady 5, N. Y.

**Safeguard, Burners**

Compact unit safeguards combustion.  
(180C)

. . . Protectoglo combustion safeguard systems available for any oil- or gas-fired ovens, furnaces, kilns employing 2 or more burners. Inconvenience and expense of installing individual relays for multiple burner applications virtually

eliminated. Reliability based on flame rectification. In contrast to flame conductivity systems, Protectoglo guards against dangers from insulation leakage.—Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa.

**Safeguard, Flame**

Protects gas-fired appliance in case of failure.  
(180D)

. . . Damage from failure of pilot gas or electric supply on industrial gas-burning appliances can be prevented by the 700 series Saf-T-Flame. Device uses flame conductivity to cut off fuel. Use of vacuum tubes is not required. Suitable electrodes surrounding the

pilot flame are connected to a relay that controls electrically-operated valves in the fuel line. The pilot conducts sufficient power to operate the relays directly. Wavering of the flame will not cause premature tripping.—The Partlow Corp., New Hartford, N. Y.

**Scale, Variable**

Multiplies graphs or curves directly, speeds data reduction.  
(180E)

. . . Linear and arbitrary non-linear functions can be handled directly by the Graph Analogue, thus eliminating time and drudgery normally spent in processing data. Instrument multiplies graphs or curves directly; divides the distance into any number of equal

spaces or into logarithmically proportional lengths or into arbitrary non-linear proportion. Unit is particularly useful in reading infrared data since required curve ratios can be obtained in one operation.—The Gerber Sales Corp., Hartford 3, Conn.

**Scales, Industrial**

Precise, strong, full-floating, double-pendulum mechanism.  
(180F)

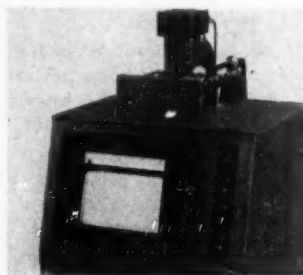
. . . Line of industrial scales offers increased precision and strength. Hand adjustments, formerly needed are eliminated. Full-floating, double-pendulum mechanism is key to improvements. Indicating heads of scales can be installed to face in any one of eight dif-

ferent directions; or they can be furnished to swivel fully through 360 deg. Heavy-capacity models have up to 9 unit weights available in standard combinations. Thus single scale can handle wider load range.—Toledo Scale Co., Toledo, Ohio.

**Scanner, Paper**

Spots thickness changes, used in paper mills.  
(180G)

. . . Instrument for paper mills measures caliper or thickness profile of paper samples. Instrument can measure straight across the sheet in contrast to previous practice of scanning moving sheet on a paper machine. It is being used to check one sample from each reel of paper produced in newsprint mill. Complete recorder-chart record of sheet thickness across paper web is obtained as sample feeds through instrument.—Tracerlab, Inc., Boston 10, Mass.

**Seal, Diaphragm**

Isolates instrument from pressure system.  
(180H)

. . . Continuous-duty diaphragm seal protects instruments from clogging and corrosion by isolating them from the pressure system. Also it permits the instrument to be changed under pressure without disturbing production. It is used with any bourdon-tube pressure instrument and in some cases bellows-

type where total maximum displacement does not exceed 0.2 cu. in. Models are available for either pipe or flange mounting. All seals except those for over-range protection will operate up to 500 F. A union connection permits removal of instrument under pressure.—Mansfield & Green, Cleveland, Ohio.



**Smokescope, Portable**

Indicates density of stack effluent. (181A)

... Portable smokescope gives precise indication of density of smoke stack effluent. A lens projects virtual image of reference standard to a focal

distance equivalent to that of the stack. Eye refocusing is unnecessary when taking readings.—*Mine Safety Appliances Co., Pittsburgh 8, Pa.*

**Spectrometer, Mass**

Operates by ion resonance, range 1 to 100 mass units. (181B)

... Mass spectrometer operates on the principle of ion resonance. Instrument can be connected directly to a stream or process line for continuous operation. Programming device allows automatic and repetitive continuous

scanning of the spectrum; manual scanning or selection of peak or peaks of given mass; and, with minor modification, automatic monitoring of one or more peaks in sequence.—*General Electric Co., Schenectady 5, N. Y.*

**Spectrophotometer**

Analyzes color accurately in 54 sec. (181C)

... Recording spectrophotometer has been redesigned with emphasis on accurate color measurements, greater sensitivity and faster operation. Instrument gives photometric accuracy of

0.5%, wavelength accuracy within 1.0 millimicrons and photometric precision within 0.2%. All components of unit are housed in a single case.—*General Electric Co., Schenectady 5, N. Y.*

**Spectrophotometer**

Automatic, rapid, highly accurate. (181D)

... Spectrophotometer runs analyses automatically with accuracies matching or exceeding best manual operation. Once controls are set, instrument can run itself. Operator is

needed only to change sample, chart paper and scanning regions. Instrument is built around single-beam monochromator.—*Beckman Instruments, Inc., South Pasadena 1, Calif.*

**System, Annunciator**

Indicates alarm sequence. (181E)

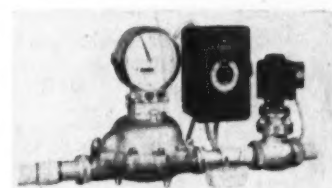
... Annunciator system automatically indicates the sequence of off-normal alarms. Sequence-indicating annunciator pinpoints the cause of trouble by indicating first variable to go off-nor-

mal. This is done either by automatically locking out subsequent signals or by causing first signal to be red and subsequent ones white.—*Pan-alarm Products, Inc., Chicago 40, Ill.*

**System, Automatic Metering**

Handles water base liquids, oils, corrosives. (181F)

... Measurement of liquid batches is done automatically by Niagara Electric volume metering system. Meters can handle either cold or hot water-base liquids, viscous oils, corrosive chemicals. Meter can actuate electrically-driven integrator at distance from meter.—*Buffalo Meter Co., Buffalo 14, N. Y.*

**System, Warning**

Warns when magnetic trap needs cleaning. (181G)

... Warning system frees the operator's mind of maintenance worries on magnetic separators. A sensitive ferrometer in the Magnalarm constantly measures the quantity of tramp iron as it accumulates on the magnet surface. Once a predetermined quantity

of iron collects, the Ferrometer trips the alarm. Then the operator knows the magnet must be cleaned. Magnalarm is used with Alnico permanent magnetic separators. Only a small amount of current is needed to power the alarm.—*Eriez Mfg. Co., Erie, Pa.*

**Telemeter**

Single circuit handles up to 15 readings. (181H)

... Transmitting circuit cost is reduced with multiplexing transmitting and receiving system for use with Metameter telemeters. System eliminates need of separate circuits for each meter. Readings can be transmitted

over telephone circuits, carrier current, or microwave. Readings transmitted are pressure, vacuum, liquid level flow, temperature, differential pressure, etc.—*The Bristol Co., Waterbury 20, Conn.*

**Television, Industrial**

High resolution at low lighting levels. (181I)

... A small industrial television camera has high resolution and operates at low lighting levels. It's recommended for watching operations or instruments in any remote, dangerous or inaccessible location. Model 300-BV

combines operational stability and constructional ruggedness. It is simple to operate and easy to service. One or more viewing screens can be used.—*Diamond Power Specialty Corp., Lancaster, Ohio.*

**Thermocouples, Checker for**

Restores faulty circuits instantaneously. (181J)

... An electrical device, the Restorer, quickly checks for faulty thermocouple circuits and repairs them at the same time. Device is available for manual

or automatic operation. It can be used on any kind of wire and for a number of thermocouple circuits.—*Sherman Electric Co., Warren, Ohio.*

## INSTRUMENTS AND CONTROLS . . .

**Thermocouple, Protected**

Metal-ceramic (182A)

. . . Advantages of metals and ceramics have been combined in thermocouple protection tube. Metal-ceramic LT-1 thermocouple well combines thermal conductivity and shock resistance of metal with oxidation and deformation

resistance of ceramics. Thermal conductivity approximates cast iron. Well can be supplied in complete thermocouple assembly in lengths of 12, 18 and 24 in.—The Bristol Co., Waterbury 20, Conn.

**Thermometer, Dial**

Combined with transmitter. (182B)

. . . High-grade dial thermometer is combined with rugged pneumatic transmitter in a temperature transmitter. Combined transmitting and indicating functions eliminate need for long lengths of capillary tubing. Any num-

ber of receivers can be operated by single transmitter, thus it's possible to indicate, record or control temperatures simultaneously at several different plant locations.—Penn Industrial Instrument Corp., Philadelphia 4, Pa.

**Thermometer, Dial**

Miniature, actuated by mercury. (182C)

. . . Miniature mercury-actuated dial thermometer used when panel or mounting space is limited. Instrument is only 2½ in. in diameter. Bulb is approximately half the length of standard size bulb. Instruments ex-

hibit accuracy, sensitivity, ruggedness inherent in all mercury dial thermometers. Available in all standard ranges with variety of bulbs.—U. S. Gauge, Div. of American Machines & Metals, Inc., Sellersville, Pa.

**Transmitter, Pneumatic**

Actuated by rotameter. (182D)

. . . Pneumatic transmitter for controlling flow is actuated by a magnet attached to the extension of a rotameter float. It provides a fast linear response in output air pressures for every position of the rotameter meter-

ing float. For each new position of the magnet, a corresponding directly proportional air pressure is produced. Any indicating and controlling receiver can be connected.—Brooks Rotameter Co., Lansdale, Pa.

**Transmitter, Pressure**

For fluid systems protects instruments. (182E)

. . . Operated with pneumatic instrument the model 6100F pressure transmitter measures liquid and gas pressure, depth, weight or volume of liquids in vented or pressurized tanks. Transmitter can be used with almost any fluid, including many that would be dangerous or difficult to measure otherwise. It provides a positive seal

between the gaging system and the fluid being measured. Essentially a one-to-one transmitter the instrument has linear response from ½ in. of water upward. Gives accurate readings up to 20 psi. in vented tanks, to 45 psi. in pressurized tanks. Withstands overpressures of 250 psi.—King Engineering Corp., Ann Arbor, Mich.

**Transmitter, Signal**

For remote metering and control. (182F)

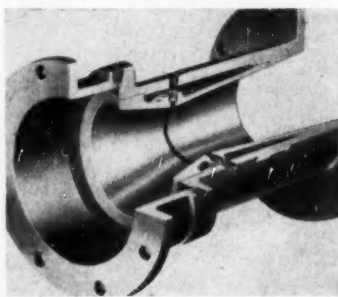
. . . The ring balance meter can be adapted to a wide variety of remote metering and control applications through use of a pneumatic signal transmitter. Transmitter is actuated by movement of the pen arm or indicator follower of the meter. No per-

ceptible load is imposed on the sensing element. Output from the transmitter can be used to actuate receiver-type integrating or recording instruments or as the actuating signal for an automatic control system.—Hagan Corp., Pittsburgh 30, Pa.

**Tube, Flow**

Gives flow rate, minimum head loss. (182G)

. . . Liquids and gases without settleable solids can be metered with the Dall flow tube Advantage include: lowest permanent head loss of any known differential producer of the velocity increaser type, short length, low weight and low cost. Constructed with a Meehanite iron body and precision-machined bronze throat liner the Dall flow tube is designed to induce a high differential pressure, then provide a high recovery of differential pressure.—B-I-F Industries, Inc., Providence, R. I.

**Tube, Thermocouple**

No junction box. (182H)

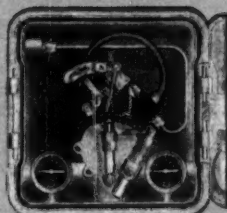
. . . Thermocouple protection tube eliminates junction boxes, prevents breathing of corrosive gases or liquids into well, holds thermocouple in place and provides fast interchangeability for

checking. Low mass of small diameter tubes gives improved accuracy and faster response. Tube is stainless steel with neoprene sealant.—Conax Corp., Buffalo 21, N. Y.

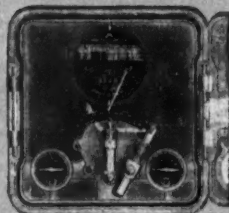
# For Precise Accuracy...Quality of Manufacture... And Outstanding Performance...



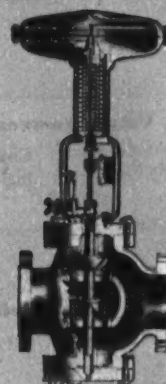
Vent Valves



Pressure Controllers



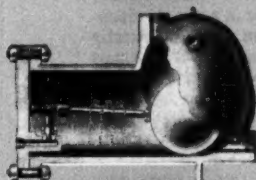
Liquid Level Control Pilots



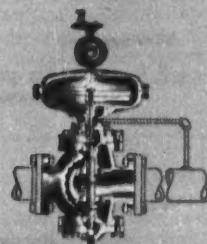
Diaphragm Control Valves



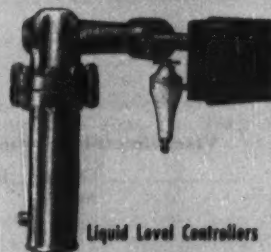
Supply Regulators



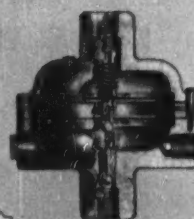
Continuous Drainers



Pressure Reducing Regulators



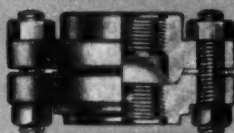
Liquid Level Controllers



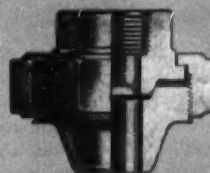
Relay Regulators



Screw Type Safety Heads



Bolted Type Safety Heads



Union Type Safety Heads

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## INSTRUMENTS AND CONTROLS . . .

**Turbidimeter, Recording**

Actuates alarm, precision  
± 3% of full scale.  
(184A)

. . . Recording turbidimeter continuously, permanently and automatically measures and records turbidity in liquids. Instrument can be used with an audible or visible alarm. Specific applications include chemical and paper plants with private water supplies

where turbidity must be controlled; monitoring wastes dumped into streams; monitoring of process filtrates. With operating pressure of 100 psi. max, inside sampling head accuracy is ± 5% of full scale.—*General Electric Co., Schenectady 5, N. Y.*

**Valve, Instrument**

Compact and light for  
high pressure. (184B)

. . . Designed for 6,000 psi. service the Hancock stainless-steel instrument valve is small, easy to handle and weighs only 2½ lb. It is intended for use on instrument panels and lines; gage, bypass and corrosive lines; and

orifice meters. Space-saving compactness permits close alignment of piping with near structure. Packing gland can be tightened readily in close quarters.—*Manning, Maxwell and Moore, Inc., Watertown 72, Mass.*

**Venturi, Miniature**

Measures low flows.  
(184C)

. . . Type TF venturi handles flows considered too small for the normal-size venturi orifice. Tubes can be furnished with inlet sized from ¼ to 2 in. There are four different ratios of throat to main in each of the sizes. Tube is fur-

nished with annular pressure-equalizing rings at the point where the main and taps are located. Tube is made in cast iron, stainless steel or bronze with choice of ends. — *Simplex Valve & Meter Co., Philadelphia 42, Pa.*

**Viscometer**

For process control, has  
increased sensitivity.  
(184D)

. . . Modification of standard industrial viscometer has increased accuracy to ¼%. Viscosity is measured by time required for piston dropping by gravity to expel liquid from a cylinder. Meas-

urement is electrically transmitted to recorder and converted into chart reading. Unit measures viscosity under pressure or vacuum. — *Norcross Corp., Newton 58, Mass.*

**Viscometer**

Rotational type covers  
wide range. (184E)

. . . Viscometran viscometer coupled to a capacitance recorder-controller records, indicates and controls liquid viscosity. Either Newtonian or non-Newtonian liquids can be measured over a wide range of viscosities. Instrument accuracy is better than ±2%, repeatability is better than 0.2%. Although similar in principle to the fa-

miliar Brookfield Synchro-Lectric viscometer the Viscometran is a rugged, flexible industrial instrument. Instrument must be mounted vertically either directly in a vessel or in a sample chamber. Installation can be made directly in flow line but location in a bypass is preferred.—*Brookfield Engineering Labs., Inc., Stoughton, Mass.*

**Viscosimeter, Continuous**

Corrects for tempera-  
ture. (184F)

. . . Viscorator, temperature-compensated continuous viscosimeter, records and/or controls viscosity at selected reference temperature. Unit can operate routinely at stream temperatures up to 700 F. and viscosities from 34

SSU to more than 10,000 SSF. Viscorator can be fitted to record any or all of these variables: viscosity of a stream, temperature of stream, viscosity corrected to reference temperature.—*Fischer & Porter Co., Hatboro, Pa.*

## Your Inventory of New Equipment and Accessories

## What It Contains . . .

This inventory digests some 371 of the most important new or improved equipment items developed or commercialized during the second six months of 1953 and the first six months of 1954. It stresses only those developments of major interest to chemical engineers in the chemical

process industries. For more about any item, write its code number on one of the Reader Service postcards (p. 35) then mail to us.

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**X-Ray Unit, Portable**

Checks welds for flaws.  
(185A)

... Andrex portable X-ray unit checks for flaws in welds of finished structures and vessels. Complete unit consists of two parts: X-ray unit containing X-ray tube, high voltage transformer, filament transformer, cooling pump; and control unit comprising

instrument, regulating devices, exposure timer, safety relays, etc. All high tension parts are combined in one single all-welded steel tank. High tension cables and separate transformer are eliminated.—*Holger & Andreassen, Inc., San Francisco 3, Calif.*

## • Maintenance Tools and Supplies

**Bender, Conduit**

Saves labor. (185B)

... Electrical conduit can be installed without elbows or couplings. Accurate bends are made with ease by one man

using portable conduit bender. Over-all savings of 20% or more.—*Tal Bender, Inc., Milwaukee 2, Wis.*

**Bender, Tubing**

For copper tubing.  
(185C)

... TT-57 tubing bender easily bends both  $\frac{1}{8}$  and  $\frac{3}{8}$  in. O.D. tubing (hard or soft copper). Tool is made of lightweight metal, weighs only 6 lb. Tube forming section is designed so that both

sizes of tubing are bent to same radius. This makes a neater looking job when different sizes of tubing are used in parallel runs.—*Tal Bender, Inc., Milwaukee 2, Wis.*

**Cap, Paper Work**

Protects workers for less cost.  
(185D)

... Workman's cap of neoprene-treated heavy kraft paper is water repellent, resists acids, alkalis and flame—replaces cloth caps with savings up to 30%. Developed by DuPont safety engineers for use in one of the large DuPont chemical plants. Cloth caps

generally are too shabby after laundering to be worn by men, thus generally are discarded without laundering. On this basis the paper cap is cheaper to be used, then discarded when appearance becomes shabby.—*Record Industrial Co., Philadelphia 4, Pa.*

**Clamp, Heavy Duty**

Seals leaks in water, steam, gasoline lines.  
(185E)

... Leaks in hot or cold water, steam, oil or gasoline lines are sealed quickly and safely with the Bel Connector. Cast iron fitting encloses leak within captive neoprene gaskets when screws are tightened around pipe. Fitting

exerts no pressure on leak or weakened area around it. All contact with pipe is through gaskets. Connectors are available in many sizes with straight or elbow form.—*Holoal Mfg. Co., Bellerose 26, Long Island, N. Y.*

**Cleaner, Heat Exchanger Tube**

Cleans tubes  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. O.D.  
(185F)

... Heat exchanger tubes cleaned easily with model PGX cleaner. Unit suitable for horizontal and vertical applications. It's positive-drive, high-speed, hollow-shaft, air-driven, scavenger-drill type using carbide tipped bits.

Air consumption: about 70 cfm. at 90 psi. Maximum power: derived at 90 psi. operating at about 3,500 rpm. Unit weighs 8 lb., is only 11 in. over-all.—*Thomas C. Wilson, Inc., Long Island City 1, N. Y.*

**Cleaner, Jet**

For cleaning equipment, no sparks or flames.  
(185G)

... Steam and hydraulic jets for cleaning equipment are built into Hydro-steam jet cleaner. For heavy-duty cleaning, all-electric unit delivers solid jet of superheated water and de-

tergent. For cleaning delicate parts, steam jet provides pin point cleaning under finger tip control. Unit eliminates fire hazards.—*Livingston Engineering Co., Worcester 5, Mass.*

**Cleaner, Pipe Joint**

Cleans pipe ends in seconds.  
(185H)

... Pipe ends or threaded joints cleaned inside or out in 6 or 8 sec. with high-speed joint cleaner. Unit speeds reconditioning of old or reclaimed well pipe and pipe lines. Cleans pipes from 2 to 10 in. Joint cleaner has air-driven motor and precessing head containing

spring-loaded brush guide and wire brush. Provision made for shooting solvent or cleaning fluid onto pipe end to dissolve caked material. Precessing head revolves around pipe end at 40 rpm.—*Airetool Mfg. Co., Springfield, Ohio.*

**Clothing, Neoprene**

Tough, comfortable and flexible.  
(185I)

... Neoprene-latex, olive-drab clothing protects the wearer from rain, salt water, acid, paint, grease, oil, gasoline, alkali, etc. Service life is said to be two or three times that of rubber or oil-skin clothing. Garments can be cleaned by rinsing in a petroleum sol-

vent cleaner, shaking and hanging out briefly. Two weights are available: a heavy for severe work and long service and a medium for those desiring something thinner, cooler and cheaper.—*M. L. Snyder & Son, Philadelphia 25, Pa.*

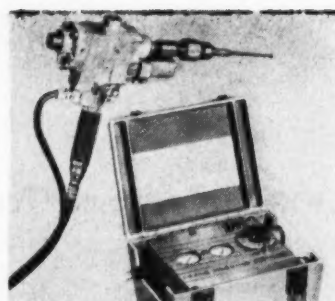


## MAINTENANCE TOOLS AND SUPPLIES . . .

**Control, Tube Rolling**

Air operated, electrically controlled. (186A)

. . . Electric control teamed with air operation permits the Electro-Pneumatic tube rolling control to give more uniform rolling. It can roll ferrous tubes up to 24 in. I.D. This makes it useful on condensers, heat exchangers, boilers, evaporators, coolers, dehydrators, etc. Control permits expansion of tube into sheet to degree of tightness and holding strength needed for specific application. Possibility of over-rolling is eliminated, cold work crystallization is minimized.—Crane Packing Co., Chicago 13, Ill.

**Coupler, Lubricating**

For high-pressure gun, has positive shut-off. (186B)

. . . Large button-head coupler for use with high-pressure lubricant hand guns and bucket pumps incorporates a positive shut-off device. This solves an important field problem by stopping all extrusion of lubricant from the

coupler immediately after removal from the fitting. Identified as the 400 button-head coupler the device has 1/2-in. pipe thread pull-on and top connections.—Rockwell Mfg. Co., Pittsburgh 8, Pa.

**Degreaser**

For parts. (186C)

. . . Degreaser rapidly cleans oily, greasy parts in pure nonflammable trichloroethylene vapors. Unit is 50-gal. barrel

type; needs only 5 gal. of cleaning solvent for effective operation.—Baron Industries, Los Angeles, Calif.

**Drill, Masonry**

Anti-stalling, alloy steel. (186D)

. . . Masonry drill, "Hi-Twist," avoids stalling from dust packing. Combination of oval flutes, narrow lands, fast spiral carries dust up and out of hole as fast as it forms. Drill made of tough

alloy steel tipped by Carboloy. Used on soft metals as well as masonry materials. Other claims: longer drill life, reduced drilling cost.—Holub Industries, Inc., Sycamore, Ill.

**Dryer, Glove**

Speeds gloves back to service. (186E)

. . . Rubber gloves dry quickly through use of accessory for Sani-Dri electric dryer. There's no danger of burning or damage to gloves. Unit can be used by food processors, chemical companies,

drug manufacturers and laboratories. Use of the device permits gloves to be washed and returned to service quickly.—The Chicago Hardware & Foundry Co., North Chicago, Ill.

**Electrode, Metal Working**

Acts as heat source, used on weld areas. (186F)

. . . Acting as source of instant heat, Thermo-Trode electrode is used for pre-heating, annealing and heat treating of weld areas. No metal is deposited. Instead the core metal is oxidized by

the arc and disintegrated into an easily removable powder. Electrode is simple to use and comes in a variety of sizes.—Eutectic Welding Alloys Corp., Flushing, N. Y.

**Expander, Tube**

Handles every size, type tube. (186G)

. . . Expansion of tubes into thick tube sheets or steam drums is speeded up by fully-automatic, controlled-retractive method. Reduces tube rolling time by doing complete job in one operation. Over-expansion, that enlarges tube holes, is prevented. Compressive load-

ing and bending of tubes avoided. One system handles every size and type of tube found in power, industrial, chemical use. Available in 2 models with choice of motors for heat exchanger or boiler work.—The Airetool Mfg. Co., Springfield, Ohio.

**Finish, Insulation**

Protects, identifies service lines. (186H)

. . . Insulcolor protects insulation and identifies service lines. This paint is solvent-free, tough, plastic-like finish that can be applied as a colorful coating on hot as well as cold lines. It withstands surface temperature to 160 F. without cracking, crazing, shrinking.

Excellent water resistance permits use over outdoor piping. Insulcolor is shipped in white only, along with separate packages containing the necessary amount of color tint for mixing as called for.—Armstrong Cork Co., Lancaster, Pa.

**Flux, Aluminum-Soldering**

Non-corrosive, solders aluminum to other metals. (186I)

. . . Two non-corrosive fluxes are available for soldering aluminum to other metals. Paste flux #18 solders aluminum with tin, lead, zinc, cadmium and their alloys. Powder flux #24

solders all commercial metals, such as steel, copper, brass, nickel, silver, aluminum. Any plain solder-torch or iron can be used.—FIM, Inc., New York 10, N. Y.

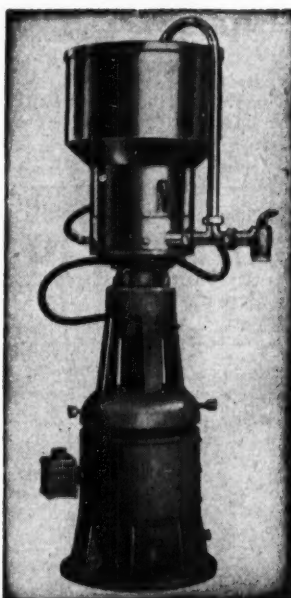
# THREE SPECIALIZED MACHINES FOR MORE EFFICIENT PROCESSING

## EPPENBACH HOMO-MIXER

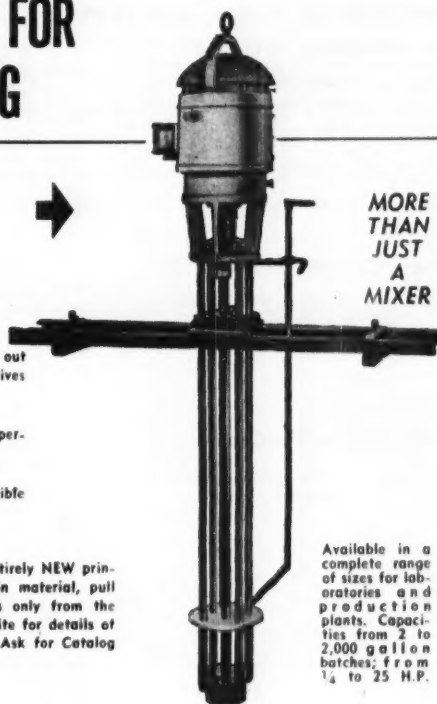
MAKE DISPERSIONS  
HOMOGENIZES

- 1 Turbine head near tank-bottom causes converging horizontal flow, carrying sedimentary material into close-fitting rotor vanes.
- 2 Inflowing "slurry" violently agitated at high velocity, projected up toward surface.
- 3 Submerged baffle plate deflects rising current toward tank sides, thence down toward bottom.

- 4 Rapid downflow submerges, wets out floating material, including additives fed into mix.
- 5 Entire batch deflocculated, giving perfect dispersion.
- 6 No surface boil—no vortex—negligible air drawn in.



This mixer is built and operates on an entirely NEW principle. Ordinary mixers create a vortex in material, pull air into tank. The HOMO-MIXER draws only from the BOTTOM of the tank with no vortex. Write for details of this mixer—"the only one of its kind". Ask for Catalog No. 402-R-1.



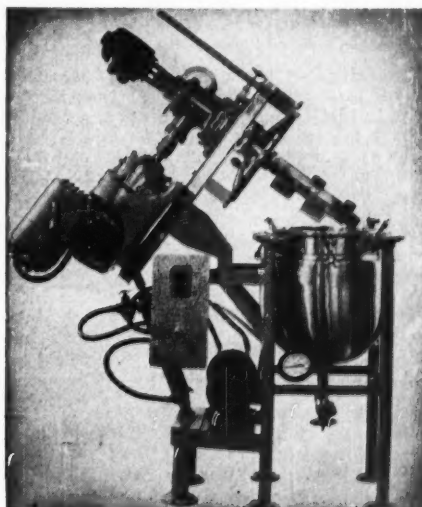
MORE  
THAN  
JUST  
A  
MIXER

Available in a complete range of sizes for laboratories and production plants. Capacities from 2 to 2,000 gallon batches; from 1/4 to 25 H.P.

## EPPENBACH COLLOID MILL NEW TYPE

Large Tangential Outlet which prevents back pressure and allows increased output capacity. Both Rotor & Stator are interchangeable Stellite rings and stones—facilitating replacement when required. Sanitary fittings throughout. Illustration shows large production Mill Model VT-11 with 15 H.P. motor. Eppenbach Colloid Mills operate at speeds approaching the theoretical minimum required for true wet micro grinding—shaft speeds up to 10,000 r.p.m. depending on size and type of mill. These Mills assure uniform grind through advanced engineering features including (1) Improved ball bearings which center the shaft and minimize lateral whip and (2) Invar shafting with zero coefficient of heat expansion. All Mills can be made with pressure feeds and jacketed hoppers. Consult our Sales Department with

your technical problems. Write for literature describing Eppenbach equipment. Direct-drive model shown operates at 3500 RPM. Higher speeds can be furnished. Colloid Mills made in all sizes 1/4 H.P. model laboratory size to 50 H.P. model.



## EPPENBACH "AGI" MIXER

MIXING AND HOMOGENIZING EQUIPMENT  
FOR VACUUM OR PRESSURE OPERATION

Affording advantages of paddle mixing and high speed homogenizing in one compact installation.

The "AgI" mixer produces uniform finely homogenized blends in a fraction of the time required by conventional mixers because it combines all the desirable features of horizontally rotating, double motion paddles fitted with scraper blades with the Eppenbach high speed, high shear Homo-Mixer. The AgI mixer is designed so that the paddles may be operated either separately from, or in conjunction with the Homo-Mixer—the complete mixing assembly being installed in a jacketed kettle which can be operated atmospherically, under vacuum, or under pressure. The unit is adaptable to any required set of processing conditions and furnished complete for immediate operation. Write for Circular 403 and additional information.

# ADMIRAL TOOL & MFG. Co. Inc.

45-10 Vernon Blvd., Long Island City 1, New York

## MAINTENANCE TOOLS AND SUPPLIES . . .

**Flux, Aluminum Welding**

Allows full view of weld,  
good temperature indica-  
tor. (188A)

. . . Type 202 aluminum welding flux allows operator to see exactly what he's doing while welding; weld puddle is not hidden behind opaque blanket of refractory slags. Flux starts to reduce oxides immediately upon application. It continues to do so throughout heating operation. Type 202 is easily re-

moved after welding, will not produce corrosive pitting on parent metal. It becomes liquid at temperature where metal is ready to weld, thus is a good temperature indicator. Type 202 welding flux is available in 1 lb. containers through supply dealers.—Solar Aircraft Co., San Diego 12, Calif.

**Gloves, Reconditioned Plastic**

Worn gloves returned to  
service. (188B)

. . . "Over-Kote" service reconditions and reprocesses worn and damaged, smooth and rough, plastic-dipped cotton gloves. Estimated 90% of gloves now discarded can be returned to service. Reconditioning includes sterilizing,

patching and repairing, reshaping, re-coating, vulcanizing and pairing at a fraction of new glove cost. Pick-up and delivery service offered through 57 outlets in 20 states.—U. S. Industrial Glove Corp., Detroit 4, Mich.

**Grating, Aluminum Floor**

Finds widening usage in  
chemical industry. (188C)

. . . Sparkless, corrosion-resistant, aluminum-alloy, floor grating now used in chemical process industries as well as in marine installations. Lightweight alloy easily removed for cleaning. Grating is

mill extruded in 6 in. sections and welded into panels to specification. Stair treads also available in 4, 6 and 9 in. widths.—Washington Aluminum Co., Baltimore 29, Md.

**Grills, Non-Skid**

Assure firm footing.  
(188D)

. . . Line of non-skid grills assures safe walking and firm footing in grease, oil, snow and sleet. Featuring lightweight design, grills are used on platforms, catwalks, stair treads for slippery floor

areas. Coroweld grills are available in various sizes to meet individual installation requirements as they arise.—Bustin Firm-Grip Grating Corp., New York 37, N. Y.

**Gun, Condenser Cleaning**

Shoots brushes through  
tubes. (188E)

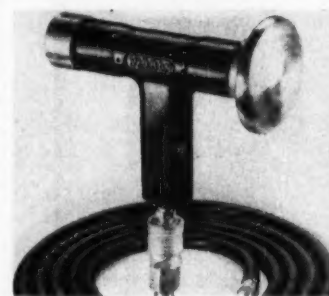
. . . Improved aluminum Jiffy gun shoots spirally-wound nylon brushes through fouled condenser and heat exchanger tubes. Spiral design of brushes gives them a spinning, scouring motion.

With flushing action of water from the gun they quickly remove sludge and soft deposits assuring optimum heat transfer through tubes.—Elliott Co., Springfield, Ohio.

**Gun, Refractory**

For fast lining and  
patching. (188F)

. . . Pneumatic refractory gun does lining and patching jobs faster and cheaper. Applied with 40 to 50% less moisture refractory surface shrinks less, dries faster and has longer life. Gun heads are two different sizes. Strokes at the rate of 4,800 per min. are produced by a piston reciprocating in a cylinder between two heads. Piston pushes against air cushion which makes for quiet operation. Bantam gun weighs 5 lb., uses 85 to 130 psi.—Vibron Div., Burgess-Sterbentz Corp., Cleveland 11, Ohio.

**Handles, Vacuum Grip**

Cut hazard of falling  
tools. (188G)

. . . Vacuum-grip handles for striking tools are designed to cut accidents from falling tools. Grip is improved by the presence of numerous conical impressions on the tool handle. These create

a suction between the hand and the handle. Slipping problem is thus minimized even with oily or greasy hands.—Ampco Metal, Inc., Milwaukee 46, Wis.

**Jacket, Nylon**

Extends wire cable life.  
(188H)

. . . Wirelon cable, originally made with a tight-fitting colorless nylon jacket, now has colored nylon covering. Jacket increases cable life up to 500%, is smooth and safe to handle, and with-

stands abrasions, kinking and corrosion. Color makes cables more easily identified making for increased safety in plant areas.—Rochester Ropes, Culpepper, Va.

**Kit, Condenser Cleaning**

Removes deposits, pro-  
tects tubes. (188I)

. . . Cleaning and application kit prolongs condenser tube life. Use of kit removes deposits, provides protective coating that is spread evenly on tube.

Job is done quickly and efficiently in three simple steps using unskilled labor.—Thomas C. Wilson, Inc., Long Island City, N. Y.



**Lance, Powder**

Pierces metal or concrete.  
(189A)

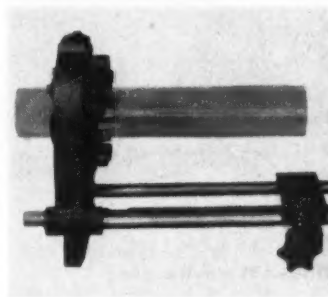
... Combustion of metallic powder in a stream of oxygen gives Oxweld ACL-1 powder lance a lethal punch for cutting and piercing operations. Lance combines advantages of powder cutting with ease and efficiency of oxygen-lance operations. Heat generated by burning powder is great enough to pierce holes

in many materials that resist standard oxygen lance, e.g. blast furnace salamanders, concrete, fire brick, aluminum billets, steel, cast iron. Special powder dispenser assures continuous, steady flow to reaction zone.—Linde Air Products Co., Div. of Union Carbide & Carbon Corp., New York 17, N. Y.

**Lathe, Glass Working**

For specialized glass  
work in plant. (189B)

... Glass-working lathe mounted either vertically or horizontally handles a broad range of jobs. On it can be made ring seals, tees, flanges, tapers, glass fusings, closures and a variety of repairs. Tubing of any length up to 100 mm. dia. can be mounted through the spindle. Extension bars grip a variety of glass shapes and sizes up to 12-in. dia. Normal chuck speed is 32 rpm. Length between chucks is 36 in., radial clearance 8 in. and through-spindle dia. 4 in.—Bethlehem Apparatus Co., Inc., Hellertown, Pa.

**Molybdenum, Sprayed**

Excellent wear resistance;  
bonds to Al, Mg alloys.  
(189C)

... Sprabond molybdenum wire is finding increasing use as a metallizing material for building up wearing surfaces. Sprabond has outstanding wear resistance when running against bronzes. Similar results also observed

on applications involving babbitt or other white metal bearings. Promising application is where abrasive wear exists without excessive shock or impact.—Metallizing Engineering Co., Long Island City 1, N. Y.

**Nameplates, Vinyl**

Remain intact perma-  
nently. (189D)

... Lucoflex unplasticized PVC eliminates problem of keeping nameplates and instrument panels intact in corrosive environments. Material's resistance

to action of most solvents, brine and other corrosives enable it to replace metal nameplates.—American Lucoflex, Inc., New York, N. Y.

**Packing**

Self-molding. (189E)

... Packing compound for valves, pumps and expansion joints is designed for steam, hot water or process air.

Coppersticks have pure copper flakes dispersed in a stick-shaped body.—Surveys, Inc., Trenton, N. J.

**Packing, Cup**

Resilient as rubber,  
tough as leather. (189F)

... Cup packings of leather impregnated with a liquid polymer now are made for high-pressure, high-temperature hydraulic and pneumatic systems. Resultant material combines resilience of rubber with toughness of leather.

After impregnation, the liquid polymer converts, at room temperature, into an elastomer. Operating range of packing is from 0 to 15,000 psi and -65 to + 200 F.—Thiokol Chemical Corp., Trenton, N. J.

**Packing, Gland**

Self-sealing, self-adjust-  
ing, for -110 to + 500  
F. (189G)

... Valve stem or gland packing is self-sealing and self-adjusting at fingertip pressures. Made of Kelon-T (Teflon), packing has Vee construction. It's used on valve stems and in hydraulic

cylinders, jacks, lifts, pumps. Natural slipperiness of material keeps packing operative after long shut-downs. You get tight sealing.—W. S. Shamban & Co., Culver City, Calif.

**Packing, Solvent-Resistant**

For non-water-soluble  
solvents. (189H)

... Style Nos. 181 and 1024 mechanical rod packings can be used when handling benzene, carbon tetrachloride, xylene, turpentine, kerosene, gasoline, Stoddard solvent and similar liquids. Packings incorporate an entirely new lubricant that is impregnated by a new

process. Style 181 is used for pumps, valves and fittings handling material up to 200 F.; has a square-braided rayon base. Style 1024 is recommended for temperatures above 200 F. It has a white asbestos base.—Flexrock Co., Packing Div., Philadelphia 1, Pa.

**Packings, Rod**

Asbestos and Teflon, for  
- 90 to + 500 F.  
(189I)

... Rod packing of braided asbestos impregnated with 35% Teflon provides longer service life under alkaline or acid conditions. Two types available: white asbestos packing impregnated with Tef-

lon resin for centrifugal reciprocating pumps and valve stems handling dilute acids and caustics; blue asbestos for strong acids.—U. S. Rubber Co., New York 20, N. Y.

## MAINTENANCE TOOLS AND SUPPLIES . . .

**Platform, Telescoping**

For overhead maintenance.  
(190A)

. . . Work platform, Scaf-Fold, telescopes up and down, has removable outrigger legs. Leveling screws aid set-ups on uneven locations. Platform is ideal

for all overhead maintenance work. Comes in one piece, easily rolled into position and raised.—Atlas Industrial Corp., Brooklyn 32, N. Y.

**Primer, Rusty Metal**

Replaces sandblasting.  
(190B)

. . . Rusty metal primer makes an effective undercoat for vinyl-resin base protective topcoating. Primer eliminates need for preliminary sandblasting. Loose rust and scale are first removed from the

surface. Then one coat of rusty metal primer is applied followed by two coats of vinyl resin anti-corrosion coating.—Surface Engineering Co., Inc., Wichita 1, Kan.

**Puller, Cell**

For battery examination.  
(190C)

. . . Cell-puller is useful for removing cells (from storage batteries) for examination or repair. Tool consists of a U-shaped steel loop brazed to a hexagonal steel nut. Nut has specially-cut

threads tapering from bottom to top. Cell-pullers are generally used in sets of two when lifting industrial batteries.—Gould National Batteries, Inc., Trenton, N. J.

**Rings, Weld-Backing**

For better, faster pipe welds.  
(190D)

. . . Pipe welds can be made smooth and uniform by using ceramic backing rings. Maximum strength and minimum resistance to flow are assured. Root penetration is complete and icicles and

weld splatter are prevented. Rings are removed from the pipe easily when the weld is finished.—Chemical Equipment Div., General Ceramics Corp., Keasby, N. J.

**Saw, Concrete**

Controlled hydraulically, saves up to 50% in time and material.  
(190E)

. . . Hydraulic controls on concrete saw provide longer blade life. Cost of diamond blade, a major factor in concrete sawing, is greatly reduced. With Hydra-Eze control, blade is lowered gently into the cut at controlled rate of speed.

There's no danger of dropping or bouncing blade against concrete. With two or three short quick strokes of hydraulic pump the blade can be raised out of the cut.—Eveready BrikSaw Co., Chicago, Ill.

**Saw, Cut-Off Power**

Non-distorting, smooth cutting.  
(190F)

. . . Two models of Super Speed power cut-off saw: one cuts pipe or tubing from  $\frac{1}{4}$  to 6 in. dia.; the other from  $\frac{1}{4}$  to 12 in. dia. An abrasive cutting wheel does cutting job. Cut surface is square

and non-distorted without misalignment or burrs. During cutting operation, pipe is held firmly while saw assembly rotates around it.—Tri-Clover Machine Co., Kenosha, Wis.

**Sealer, Inert Pipe Thread**

Contains Teflon; prevents spiral working, leakage, contamination.  
(190G)

. . . Tefilm is a chemically-inert pipe-thread sealer formulated with base of Teflon. Properties of Teflon make it possible easily to break joints—when necessary—without galling or shearing threads. Thus expensive alloy fittings can be reused. Two consistencies of

Tefilm are offered—light bodied and viscous. Both are suitable for all chemicals to which Teflon is inert and for temperatures to 400 F. They prevent spiral working, leakage and contamination of material.—Eco Engineering Co., Newark, N. J.

**Stand, Oil Drum Tripod**

Completely drains 55-gal. drums.  
(190H)

. . . Tripod, oil-drum drain stand facilitates recovery of last drop of liquid from standard 55-gal. container. Has advantages over pumps ordinarily used to dispense oil from drums; delivers last few quarts normally remaining in bottom of drum. Up to 10 qts. of oil

recovered by inverting drum over screened opening of drum-stand. Faucet on stand reservoir feeds oil into smaller containers. Sliding cover over mesh opening keeps out foreign matter.—West Bend Equipment Corp., West Bend, Wis.

**Tape, Pressure-Sensitive**

Identifies pipe lines.  
(190I)

. . . Printed pressure-sensitive vinyl tape is used for pipe line identification. Pipe-marking material will serve for years without fading. Colorfast inks are sealed

into tape itself. Tape is extremely flexible and conforms to most contours.—Printed Cellophane Tape Co., Los Angeles, Calif.

**Tape, Sealing**

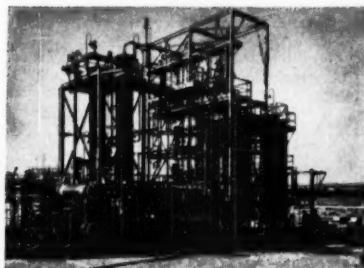
Pressure-sensitive type resists chemicals.  
(190J)

. . . Pressure-sensitive tape, Temp-R-Tape T has excellent chemical resistance and adhesive qualities over a wide range of temperatures. Tape base is Teflon. Adhesive is a silicone polymer that's completely effective from - 80 to + 400 F. Tape adheres readily to a

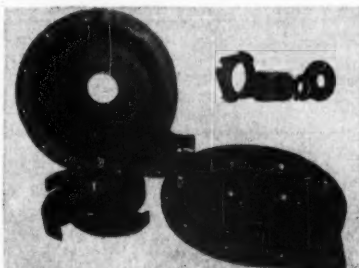
variety of surfaces including glass, aluminum, steel, phenolics, copper and brass. Physical characteristics indicate it can be used for sealing high temperature and chemical ducts.—The Connecticut Hard Rubber Co., New Haven 9, Conn.

# WHERE **HAVEG** EQUIPMENT IS INSTALLED

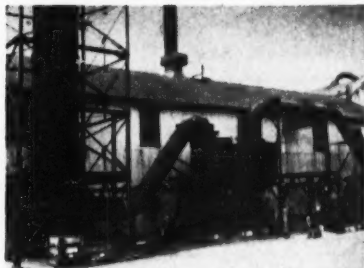
TRADE MARK REG. U. S. PAT. OFF.



**PETRO-CHEMICAL** plants have been designed and built primarily around the use of Haveg . . . in pressure tanks, absorbers, pipe.



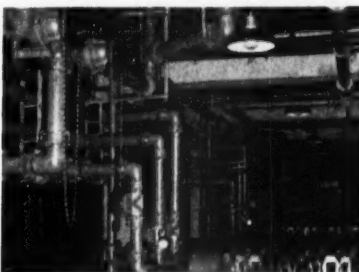
**PUMP PARTS**, made from Haveg, used in hot acid, last over 33 months without replacement. Even longer life is common.



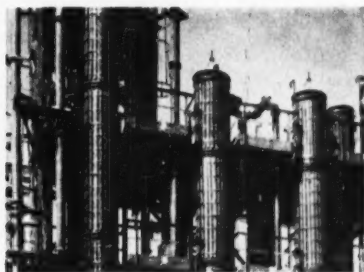
**STACKS AND FUME SYSTEMS** of Haveg pay for themselves by lasting for years without repairs. This stack is 200' high, 5' dia.



**BIG TANKS** can be made rapidly from Haveg. The world's biggest single-piece molded tanks, each holds 7500 gallons.



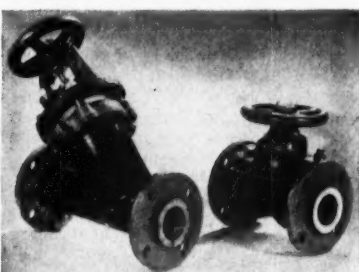
**PIPE** and fume duct made of Haveg withstands rapid temperature changes, takes high heat with complete safety, is easily installed.



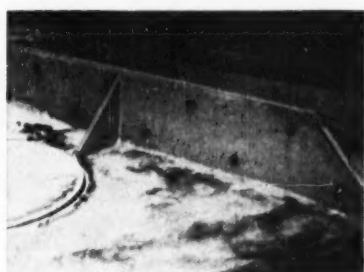
**TOWERS** bigger, better, more corrosion resistant are made from Haveg, the construction material that widens design ranges.



**PICKLING TANKS** of Haveg prevent specking or flaking, reduce rejects, make plating uniform. Molded tanks can be made any size.



**VALVES** of Haveg are made in Y-valve and diaphragm styles, with interchangeable parts, smooth operation, long service life.



**POLYESTER-GLASS** equipment is now being made by Haveg—towers, ducts, tanks, linings. Shown is a P-G acid tank cover.

## Chemical Corrosion has been Controlled!

Haveg is a molded rigid plastic material made from acid-digested asbestos and synthetic resins selected for difficult service with corrosives. It can be used continuously in a high range of process temperatures with safety and a proven history of performance.

Also, to more completely cover customers' requirements, the Haveg Corporation has added to its long list of corrosion-

resistant products: Polyester-glass and polyvinyl chloride equipment. A wide range of acid-proof cements for brick work and field fabrication. Specialties made from duPont's Teflon—sheets; gasket, packing, diaphragm materials; rods, tubes.

For full information, call the sales engineer listed, see Chemical Engineering Catalog, write for big 64-page Bulletin F-6.

ATLANTA, Exchange 3821 • CHICAGO 11, Delaware 7-6088  
CINCINNATI 36, Sycamore 2600 • CLEVELAND 20, Washington 1-8700  
DETROIT 39, Kenwood 1-1785 • HOUSTON 4, Jackson 6840  
LOS ANGELES 14, Mutual 1105 • SEATTLE 7, Hemlock 1351  
ST. LOUIS 17, Mission 5-1223 • WESTFIELD, N. J., Westfield 2-7383

**HAVEG CORPORATION**  
NEWARK 2, DELAWARE  
FACTORY, WILMINGTON 8, DEL. • Wilmington 3-8884  
A SUBSIDIARY OF CONTINENTAL DIAMOND FIBRE CO.



## MAINTENANCE TOOLS AND SUPPLIES . . .

**Tape, Self-Bonding**

Plastic, seals against corrosion. (192A)

. . . Polyethylene tape for conduit joints withstands corrosive action. When applied to joint, Bi-Seal Type 2 fuses into solid mass of corrosion-resistant insula-

tion. Fusion is so complete that minutes after application it's impossible to delaminate.—*Bishop Mfg. Corp., Cedar Grove, N. J.*

**Welder, Arc**

Higher efficiency. (192B)

. . . D. C. arc welder is small and light, is easy to maintain and operate. Machine incorporates all advantages of

selenium rectifier type welder.—*Westinghouse Electric Corp., Pittsburgh 30, Pa.*

**Wiper, Industrial**

Disposable, always clean. (192C)

. . . Disposable industrial wiper consists of two "Perf-Embossed" paper sheets welded together for durability, thorough cleaning action and maximum

dirt retention. Chemical treatment also creates all-important wet strength. Wipers are packaged 125 per box.—*Scott Paper Co., Chester, Pa.*

• **Materials of Construction****Alloy, Aluminum**

Approved for pressure vessels. (192D)

. . . Aluminum alloy GR40A now approved by ASME Boiler Code Committee for use in construction for unfired pressure vessels. Material has stronger mechanical properties than any previous aluminum alloy approved for welded pressure vessels. Also it main-

tains its strength at higher temperatures. Alloy can be welded by conventional means but the inert-gas, metal-arc process is preferred. On an equivalent strength basis this alloy is more economical than others.—*Aluminum Co. of America, Pittsburgh 19, Pa.*

**Alloy, Hard**

Exceptional wear under abrasive conditions. (192E)

. . . Exceptional wear life under abrasive conditions is claimed for Ze-Ve-Seal W Series chrome-ferrous alloy. Field tests are said to show the material outwears other commonly used wear-resisting ma-

terials by 3:1. Among applications tested were pug-mill paddles, conveyor rollers, fertilizer mixer blades, sand mill plows.—*Calumet Steel Castings Corp., Hammond, Ind.*

**Alloy, Nickel**

Extends heat-resistant range, resists oxidation. (192F)

. . . Heat-resistant alloy NA22H can be used at temperatures up to 2,200 F.—200 F. above previous design limit for heat-resistant alloys. Use of NA22H permits increased furnace capacity and efficiency. Aside from unique properties

above 2,000 F., alloy can be used in range of 1,700 to 2,000 F. It is said to show big savings because of superior structural stability and resistance to oxidation.—*Blaw-Knox Co., National Alloy Div., Pittsburgh 30, Pa.*

**Alloy, Non-Lead**

Good radiation shield, used in isotope storage containers (192G)

. . . Mallory 1000, a non-lead alloy, is used as an efficient radiation shielding material. Metal is a high density homogeneous alloy of tungsten, nickel and

copper. Metal is good for betatron, synchrotron and cyclotron radiation.—*P. R. Mallory Co., Inc., Indianapolis 6, Ind.*

**Alloy, Titanium**

Stronger at normal and high temperatures. (192H)

. . . Titanium-base alloy C 130 AM is claimed stronger than pure titanium. Contains 4% aluminum and 4% manganese is 8% stronger at room temperature and twice as strong at high tem-

peratures. Alloy also retains maximum forgeability. It's stronger than aluminum or steel under conditions found in jet engines.—*Rem-Cru Titanium, Inc., Pittsburgh 22, Pa.*

**Aluminum, Copper-Clad**

Reduced costs, wide range of sizes opens up new markets. (192I)

. . . Alcuplate, copper-clad aluminum, is marketed at prices 15 to 30% below equivalent amounts of copper or brass. It's now available in greater quantities and a wider size range. Continuous

bond with strength as great as aluminum. Lightweight, easily soldered and electroplated. Supplied soft or in cold-worked tempers.—*Metals & Controls Corp., Attleboro, Mass.*

**Aluminum, Coated**

Continuous film, free of pinholes. (192J)

. . . Aluminum base can be coated with Kel-F fluorocarbon film ranging from 0.005 to 0.01 in. thick. Applied from a dispersion, coating has no pinholes. It's so tightly bonded to the metal that it can't be peeled or stripped. Coated

metal can be bent and deformed without rupturing or damaging the protective film. Process is performed on a contract basis at the plant where it was originated.—*Connecticut Hard Rubber Co., New Haven, Conn.*



**Baffles, Fiberglass**

Reduce noise level, wire suspended. (193A)

... Noise-stop baffles of plastic-encased Fiberglas now hung on wire. Eliminate obstacles encountered in installations having obstructions like sprinklers, pipes, bus bars. Baffles made of fine glass fibers bonded with thermosetting binder to produce rigid panel 24 x 48 x 1½ in. Stainless steel wires, inserted

through board, are formed into hook at top and secured to top and bottom with stainless steel-saddles. Baffles installed on parallel wires stretched over open area. Wire spacing varies between 3 and 7 ft. assuring adequate flexibility.—Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

**Binders, Latex**

Toughen concrete flooring; similar to regular concretes, plasters. (193B)

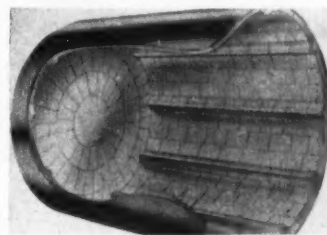
... Special latex binders impart toughness, flexibility and water resistance to line of flooring and surface coating materials. Materials will bind to masonry, concrete, wood, glass, plaster. One variation of Surco coating has outstand-

ing waterproofing qualities, another has good wear resistance. Thin layer of material needed for flooring obviates need for structural changes to support it.—Surface Coatings, Inc., Atlanta, Ga.

**Brick, Mill Lining**

Alumina ceramic, furnished to size. (193C)

... High density mill and tank lining brick made of alumina resists abrasion and attack from all acids except hydrofluoric, gives extended service life. Special brick for lining mill heads are furnished to size, greatly reducing the number of cement joints and eliminating all corners. Rectangular bricks are made in double size. Lifter bars are integral part of bricks.—LZP Industrial Ceramics, Denver 4, Colo.

**Carbide, Cemented Chrome**

Available in many grades. (193D)

... Unlimited number of cemented chrome carbide grades now available opens up new uses for the metal. Included among the grades of material are a number of more wear-resistant compositions. There also are a number of

grades with higher erosion and corrosion resistance. Uses recorded to date show chrome carbide to be outperforming other metals in spray nozzles, steam valves and orifices.—Carboloy Dept., General Electric Co., Detroit 23, Mich.

**Channel, Structural**

Used without welding or drilling. (193E)

... Versatile structural-steel framing member needs no welding or drilling. Tools for assembly: wrench and hacksaw. Versabar, from cold-rolled steel, comes in 4 basic sizes. Standard and

special fittings used for erecting structures with channel. Suggested uses: motor bases and supports, pipe clamps and supports, machinery mounts.—M-H Standard Co., Jersey City 4, N. J.

**Coating, Neoprene**

Yields thick film, cures at room temperature. (193F)

... Special formulation, Neoprene 100, eliminates 10- to 20-coat system formerly required to line tanks with neoprene. Brush coats 10 to 20 mils thick can be applied. Physical and corrosion-resistant properties compare with heat-

cured neoprene. Primer developed for use with Neoprene 100 is suitable for sandblasted and wire-brushed rusty steel surfaces. Primer is resistant to direct and creep corrosion.—Carbolite Co., St. Louis 19, Mo.

**Coating, Surface**

Protects against weathering. (193G)

... Palladium Mastic Type 3X is a tough, durable water-repellent and fire-resistant coating used to resurface storage tanks. Applied to thickness of ¼ in. at 180 lb. pressure, it assures complete

protection against corrosion and weathering. It forms an insulating, acid and alkali resistant coating that gives long service.—Emjay Maintenance Engineers, Rutherford, N. J.

**Deck, Metal Roof**

Guarded by vapor barrier. (193H)

... Metal roof deck for heavy industry is fully protected from corrosives and high humidity conditions. Three protective coatings are applied to the steel; a bond coat, a weather-sealed asphaltic plastic coating and a pure mineral mica topping. Panels are 24 in. wide. Tele-

scoping ends provide for snug nesting of end laps and give a smooth unbroken roof surface. Sound absorbent qualities reduce dangerous reverberant noise prevalent in ordinary metal roof deck.—Plasteel Products Corp., Washington, Pa.

**Flooring, Industrial**

Can withstand thermal shock. (193I)

... Aluminum-rod heat conductors embedded below the surface enable an industrial flooring to withstand temperatures to 2,000 F. Intense heat is

dissipated rapidly through the rods over a wide floor area. Other characteristics: thermal shock and wear resistance.—Flash-Stone Co., Inc., Philadelphia, Pa.

## MATERIALS OF CONSTRUCTION . . .

**Insulation, Glass Pipe**

Molded in one piece.  
(194A)

. . . G-B Ultrafine pipe insulation, when spread open at seam and placed around pipe, snaps back to cylindrical shape. Thermal conductivity is lower than conventional pipe covering. Furnished in 6 ft. sections, it's claimed 4 to 10 times lighter than conventional covering. Made of fine blown glass fibers bonded

with phenolic resin. Easily cut with ordinary knife. Resistant to most acids and alkalis, rot, mold, decay, moisture absorption. Suitable for heated piping applications up to 350 F. and all types of low temperature applications. Used on high temperature jobs. — Gustin-Bacon Mfg. Co., Kansas City, Mo.

**Insulation, Glass Pipe**

Efficient for low pressure.  
(194B)

. . . Low pressure pipe insulation constructed of Fiberglas claimed to have good insulating properties. It's designed for cold water, hot water, or low pressure steam lines on interior locations. For hot water or low pressure steam

lines it has a canvas covering; for cold water lines a jacket of asphalt-saturated kraft paper protects against condensation. With water proof jacket insulation can be used outdoors. — Owens-Corning Fiberglas Corp., Toledo, Ohio.

**Insulation, Magnesia**

Resists severe exposure to water.  
(194C)

. . . For hot piping and equipment a new 85% magnesia resists the damaging effect of severe water exposure. Comparative tests with four other leading insulating materials show little if any damage after 30 cycles of immersion for 7 hr. in boiling water followed by drying on steam pipes for 17 hr., topped off by 168 consecutive hr. of immersion. The other four insulations suffered severe damage or complete destruction.—Magnesia Insulation Manufacturers' Assn., Washington 4, D. C.

**Insulation, Pipe**

Aluminum-jacketed  
Foamglas.  
(194D)

. . . Foamglas pipe covering now is furnished with an integral aluminum jacket. This gives moisture-proof insulation, weatherproof jacket and attractive finish all in one; eliminates costly insulation steps. Just slip covering around pipe and apply bands at

segment joints and center. Refrigerated lines need joint-sealing compounds. Insulation comes in six thicknesses for pipe sizes up to 14 in. Range of thicknesses makes insulation useable from -50 to + 800 F.—Pittsburgh Corning Corp., Pittsburgh 22, Pa.

**Insulation, Pipe Fitting**

Premolded in halves.  
(194E)

. . . Molded insulation in preformed halves installs rapidly, is used for moderate low temperatures and up to 450 F. Halves can be stapled, wired or taped together. Canvas, vapor-barrier-mastic or cement used for exterior surface. In sizes to fit American Standard Cast

Iron screwed ells, tees and 45's for 4 to 8 in. pipe; and for Standard Butt Welded Long Radius ells and 45's for 2 to 8 in. pipe. Screwed tee insulation used on gate and globe valves.—Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

**Insulation, Refractory**

Guards LPG tanks from fire, keeps temperature below safety limit.  
(194F)

. . . Lightweight insulation, K-20 concrete mix (applied with a cement gun), furnishes protection against fire to above-ground propane and butane storage tanks. Prior to application, tank is covered with corrosion-resistant paint. Steel car-banding straps are tightened around the tank at intervals. To these are fastened bent clips. Finally, galvan-

ized-steel, wire-mesh reinforcement is attached to the clips. Insulating material is applied to a thickness of 1½ in. After the cement has dried it's sprayed with a waterproof coating. Under test exposure of 1,800 F. for 2 hr. steel plate protected by insulation did not exceed 400 F.—The Babcock & Wilcox Co., Refractories Div., New York 17, N. Y.

**Lining, Kel-F Tank**

Safeguards against corrosion.  
(194G)

. . . Development of welding method for Kel-F film makes it usable for lining tanks. Welding procedure is only successful in bonding film to itself. Lining must be supported inside tanks by acid-

brick structure. Special procedure makes possible protection of film from mechanical damage during installation. The U. S. Stoneware Co., Akron 9, Ohio.

**Lining, Tank**

Prevents corrosion.  
(194H)

. . . Plasticote tank lining protects new and old hot water generators and storage tanks from corrosion. Material gives non-porous, insoluble coating. Once

lining is applied, maintenance costs are eliminated. Lining also provides extra insulation.—Metalweld, Inc., Philadelphia 29, Pa.

# TEST THESE Corrosion-Resistant Alloys

... and see for yourself  
how economical they are

The only way you can be sure that a corrosion-resistant material will work in your plant is to test it under actual operating conditions. Laboratory tests will give you some idea of what to expect, but they don't show the effects of the variables involved in production operations. That is why we have prepared standard test specimens of HASTELLOY nickel-base alloys . . . and they are available to you without cost.

Test these alloys yourself against the materials you are now using, or against others that you are considering using. Prove to yourself that they have exceptional corrosion resistance . . . high mechanical strength, even at elevated temperatures . . . and that they are economical to use. We can support these claims with records of laboratory tests and with case histories of actual installations in chemical, petroleum, textile, and metalworking plants over the past 20 years. But don't take our word for it—see for yourself.

Use the handy coupon below to order your samples of HASTELLOY alloys. Alloys B, C, and F are available in either cast or wrought forms, while alloy D is supplied as castings only. If the equipment you have in mind is to contain welded joints, be sure to advise us, so that we may furnish you with welded samples.

"Haynes" and "Hastelloy" are registered trade-marks of Union Carbide and Carbon Corporation.



*These standard spool-type test specimens of HASTELLOY alloys are available on request.*

<b>HAYNES</b> Trade-Mark	<i>alloys</i>	USE THIS HANDY COUPON	Haynes Stellite Company, UCC, 721 S. Lindsay St., Kokomo, Ind.	
<b>Haynes Stellite Company</b> A Division of <b>Union Carbide and Carbon Corporation</b> UCC			Please send me, without obligation, the following samples of HASTELLOY alloys: (Please Check)	
			CAST	WROUGHT
			<input type="checkbox"/> B	<input type="checkbox"/> C
			<input type="checkbox"/> D	<input type="checkbox"/> F
			<input type="checkbox"/> B	<input type="checkbox"/> C
			<input type="checkbox"/> F	
			<input type="checkbox"/> Above samples should have welded joints.	
			NAME _____	
			COMPANY _____	
			ADDRESS _____	

## MATERIALS OF CONSTRUCTION . . .

### Plate, Nickel-Clad Steel

Electroclad, more economical (196A)

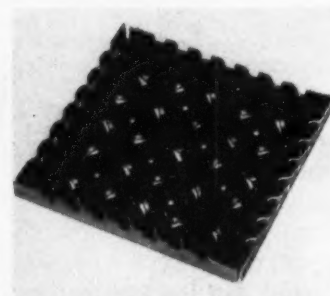
. . . Steel, clad with nickel by electro-deposition, is more economical than plates clad by rolling. Thickness of nickel can be tailored to the need, is not controlled by the thickness of the base metal. Plates up to 8 x 20 ft. are being clad with nickel deposits up to

0.020 in. thick. The layer of nickel is bonded tenaciously; is ductile and pore-free. Lectro-Clad plates will withstand heating, forming, bending and other fabricating processes without damage to cladding.—Bart Mfg. Co., Belleville, N. J.

### Plates, Steel Floor

Anchored in concrete matrix. (196B)

. . . Industrial steel Ancor floor plate has fingers extending from the surface and under-edges. These anchor the plate firmly in place when it is embedded in concrete. Concrete which fills in the perforations of the plate provides 31 smooth islands per sq. ft. making a safe, quiet traction pattern in the flat surface. Plates can be installed over sound wood floors, new or old concrete, or in place of worn brick, wood blocks, faulty metal plates or sheets.—Flash-Stone Co., Inc., Philadelphia 40, Pa.



### Rod and Tubing, Silica

Opaque, made to close tolerances. (197C)

. . . New manufacturing processes supply opaque silica rod and tubing with absolutely regular shapes and thoroughly glazed surfaces. Precision of bore and wall thickness opens up new uses for

material. Super-smooth surface and uniformity are important in minimizing devitrification at high process temperatures.—Quartz Products Corp., Keasby, N. J.

### Sheets and Plates, Plastic

Corrosion-resistant, polyvinyl chloride. (196D)

. . . Completely unplasticized and unmodified polyvinyl chloride is available in plates and sheets. Thickness of Vyflex PVC plates ranges from  $\frac{1}{16}$  to 1 in.; sheeting from 0.012 to 0.025 in. All

standard methods of thermoplastic fabrication technique can be used with Vyflex material. Also, PVC can be fabricated by hot gas welding.—Kaykor Industries, Inc., Yardville, N. J.

### Sheeting, Rubber Protective

Combats abrasion and corrosion, lowers maintenance cost. (196E)

. . . Iron-Rubber, a rubber protective sheeting, is used on chutes, hoppers and launders, bar mills, ducts and pipes, tanks, shaking tables. Among advantages are increased equipment life and

increased production by eliminating shutdowns for time-consuming repairs. Iron-Rubber sheets come either reinforced and non-reinforced. — Magic Chemical Co., Brockton 2, Mass.

### Smokestack

Has glass lining. (196F)

. . . Industrial smoke stack, coated inside and out with two 0.005-in. glass linings, resists corrosion from acid condensate in smoke. Long life of unit

should lead to cutbacks from present U. S. level of 5,000 stack replacements per year.—A. O. Smith Corp., Milwaukee, Wis.

### Stack, Concentrator

Good for hydrofluoric fumes. (196G)

. . . Concentrator stack for Southern chemical company fabricated of a polyester laminate. Reinforcement was special combination of Fiberglas and cotton. Stack measured 32 ft. high with a diameter of 5 ft. It was fabri-

cated to specification in three sections then shipped to the plant site by flat car. Joints for assembly were made in the field during erection.—Schori Process Div., Ferro-Co., Corp., Long Island City 1, N. Y.

### Surfacing, Hard

Applied on acid-sludge pumps. (196H)

. . . Metco-Weld H alloy, a chromium boride, is applied with a metallizing gun, then fused with an acetylene torch. Surface outwears hardened steels by 3

to 10 times; is non-sparking, non-magnetic and has a low coefficient of friction.—Metallizing Engineering Co., Long Island City 1, N. Y.

### Wall, Precast Concrete

Cuts cost 33%, halves erection time. (196I)

. . . Nine man crew and mobile crane erect 2,500-3,500 sq. ft. exterior wall in single working day. Walls erected in sections made of 2 layers of wire-reinforced concrete with insulated filling (wood or glass). Panels 5-8 in. thick.

Choice of panel sizes. Forms are steel, lined with muslin, mounted on railroad rails. Panels can be trucked economically as far as 300 mi. to point of erection.—The Marietta Concrete Corp., Marietta, Ohio.



## • Mechanical Equipment

### Bearing, Ball

Has zone-hardened race.  
(197A)

... Through use of patented, induction-heating process, inner race ring of Sealmaster ball bearing units is zone-hardened on ball path section only. Ball races are of double-extended type. Extended portions of ball race aren't hardened. Thus hardened set screw threads bind tightly against soft race threads for

positive locking. Double extension of the inner race ring affords maximum support of bearing on shaft. A positive lock is guaranteed between inner race and shaft. This positive locking feature effectively reduces shaft wear and fretting corrosion. — *Stephens-Adamson Mfg. Co., Aurora, Ill.*

### Bearing, Roller

Carries more, has longer life.  
(197B)

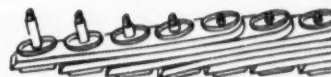
... Spherical roller bearing has from 25 to 50% greater antifriction bearing capacity. Service life is 2 to 3½ times longer than formerly possible. Out-

standing improvements have been made without any change in size or weight of bearing. — *SKF Industries, Philadelphia 32, Pa.*

### Belt, Adjustable V-

Strong, durable, easy coupling.  
(197C)

... Veclos adjustable V-belts TD and TE for D and E drives couple and uncouple with ease, have strength and durability. Belts' plys are treated high-tensile strength canvas duck. Individual links are designed for strength and beveled for flexibility. Plys are joined by riveted studs with removable cup washers and T-screws. Two types: regular rubber coated for general service and oil-proof for oily conditions and high temperature drives. — *Manheim Mfg. & Belting Co., Manheim, Pa.*



### Belt, V-Type

Transmits 40% more power.  
(197D)

... Horsepower capacity of the Super-Power V-belt is claimed 40% greater than other standard makes. On new drives narrower sheaves can be used. Belt matching problems are virtually eliminated since the belt has little if

any stretch. Increased strength comes from a new synthetic fiber. All rubber in belt is synthetic. Belt is oilproof, non-sparking and heat-resistant. — *Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J.*

### Brazing, Equipment for

Strong, corrosion-resistant joints at high temperatures.  
(197E)

... Micro-brazing is one of few techniques offering strength and resistance at high temperatures, especially for use with stainless steel and high nickel alloys. Micro-Braze (nickel chrome) alloy forms a new alloy when brazed with

parent metal in dry hydrogen atmosphere. Ductility, shear strength, tensile strength and corrosion resistance are similar to those of stainless-steel parent metal. — *Twigg Industries, Inc., Terre Haute, Ind.*

### Cage, Seal

Snap-around, one piece Teflon.  
(197F)

... One-piece flexible Teflon seal cage overcomes handicaps experienced with two-piece metal lantern rings. It's used with stuffing boxes on pumps, mixers, reactors and other types of processing equipment. Cage is sufficiently flexible to snap easily over shafts without need

for dismantling pump or pulling shaft. It will not score shafts even at high speed and will outlast metal rings. Chempro seal cages are made in standard or special sizes. — *Chemical & Power Products, Inc., New York 9, N. Y.*

### Cleaner, Compressed Air

For wide range of temperatures, humidities.  
(197G)

... Redesign of Vi-Speed dehumidifier makes it more efficient under normal plant conditions. Scope of compressed air cleaner also extends to operations under greater extremes of temperature, humidity, atmospheric pollution. Im-

provements include a self-adjusting nozzle coupled with non-clogging aspirator, enlarged and repositioned baffle surfaces and larger area for separation of heavy impurities. — *Van Products Co., Erie, Pa.*

### Clutch, Friction

Limits torque, protects from overload.  
(197H)

... Line of adjustable torque-limiting slip-type friction clutches saves time and labor in replacing broken shear pins while providing adequate overload protection. They're ideally adapted as overload protection devices in power drives of industrial machinery. Torque-limiting

clutches are made in 4½, 5½ and 6½-in. diameter sizes with ratings of 55, 121.5 and 260 ft. lb., respectively. Maximum bores with standard keyways are 1, 1½ and 2½ in. Torque ratings are conservative, assure long life. — *Morse Chain Co., Detroit 10, Mich.*

**MECHANICAL EQUIPMENT . . .**

**Compound, Bearing**

Works under corrosive conditions. (198A)

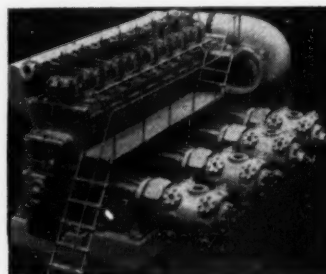
. . . Bearing compound style FM-4 is suitable for corrosive service. It's a hard, low-friction material compounded of Teflon, glass, graphite and inert lubricant. Bushings and bearings of FM-4 can be machined to close toler-

ances. They compare favorably with metal bearings and bushings for wearability; can withstand strong acids and solvents at both normal and elevated temperatures.—Chemical & Power Products, Inc., New York 9, N. Y.

**Compressor, Gas Engine**

Low fuel consumption, 25% less water cooling load. (198B)

. . . Outstanding power and economy from Model TRA gas engine-driven compressor unit. Waste heat, velocity and mass flow of exhaust gases used to drive radial in-flow turbine. Centrifugal compressor connected to turbine. Advantages: 50% more power than any non-turbocharged unit of comparable bore and stroke, low fuel consumption, 25% less water cooling load than best non-turbo high compression gas engine compressor.—Clark Bros., Co., Olean, N. Y.



**Couplings, Flexible**

Geared, sturdy, light. (198C)

. . . High-speed and high-torque shaft connections can be made with line of geared flexible couplings. They combine sturdiness and light weight; accom-

modate a reasonable amount of shaft misalignment and end float while transmitting power efficiently.—Link-Belt Co., Chicago 1, Ill.

**Drive, Variable-Speed**

Low cost, flexible. (198D)

. . . Flexi-Speed variable-speed drive unit designed for drives of 1 hp. or less. Combines low unit cost with unmatched flexibility in operation and application. Units can be mounted in almost any position around driven equipment. They can drive in any direction; deliver any desired speed

within a ratio of 8 to 1. Speed control handwheel can be located parallel to or in any of eight positions perpendicular to motor shaft. Six different belt lengths offer wide choice of shaft center distances. Flexi-Speed drives available in  $\frac{1}{2}$ , 3- and 1-hp. capacities.—Reeves Pulley Co., Columbus, Ohio.

**Drive, Variable-Speed**

Long life from rectifier tube. (198E)

. . . For variable speed jobs in the 30 to 50 hp. range the Xatron VS drive offers greater speed ranges, close regulation, light weight and long life. Basic element is single-anode mercury-pool

rectifier tube. It converts a.c. voltage to controlled variable d.c. voltage. Output voltage can be held accurately at low values.—Reliance Electric & Engineering Co., Cleveland 10, Ohio.

**Drive, Variable-Speed**

Controlled pneumatically. (198F)

. . . The Varitrol pneumatic control responds to variable pressure, temperature, speed or liquid level to regulate the Varidrive variable-speed drive. Control operates on supply air at 60 to 100

psi.; signal air pressure is 3 to 15 psi. Relationship between signal pressure and speed is approximately a straight line.—U. S. Electrical Motors, Inc., Los Angeles 54, Calif.

**Drive, Variable-Speed**

Two types, accurate control. (198G)

. . . Positive infinitely-variable-speed P.I.V. drives are available in two types for 20 to 25 hp. application. In addition to basic H-6 P.I.V. of 25-hp. capacity an HG-6 drive can be supplied

with either single reduction input or output gears. An alternate design, HGG-6 drive, has single reduction on both input and output gears.—Link-Belt Co., Chicago 1, Ill.

**Drive, Variable-Speed**

Controlled by signals. (198H)

. . . Speed of electronically-controlled variable-speed drives can be made responsive to signals based on speed, load, current, voltage, pressure, light, temperature or time. Speedranger units operate on either 2 or 3 phase a.c.

power. Input is converted to d.c. by motor-generator set and tube-type electronic rectifiers. Output d.c.-power drives variable-speed, shunt-wound motor.—Master Electric Co., Dayton, Ohio.

**Engine, Gas**

Drives compressors economically. (198I)

. . . Gas engine for driving compressors use 10% less fuel than predecessor. Will cut fuel consumption to as low as 7,500 Btu. per hp.-hr. GMVA is

built with 4, 6, 8 and 10 cylinders providing horsepower capacities from 540 to 1,370.—The Cooper Bessemer Corp., Mount Vernon, Ohio.

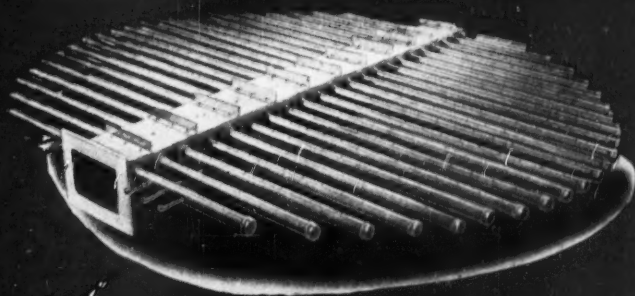
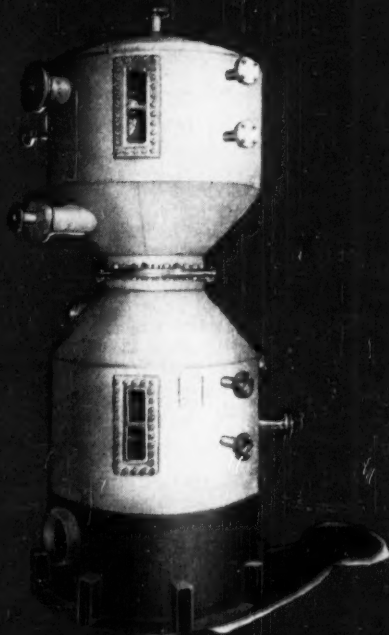


# Specialized Process Equipment

For vessels, heat exchangers, pressure vessels and special piping—designed and manufactured to meet your particular requirements—please write to the Vulcan Manufacturing Division.

With over a half-century experience in the specialized building of heavy, metal-fabricated custom-built equipment for the chemical and process industries, Vulcan today stands uniquely ready to meet your special equipment needs. Our engineers, designers, and production experts are thoroughly experienced in studying special equipment problems with a trained eye for engineering quality and manufacturing economy.

If you have a process equipment problem, why not bring it to Vulcan? Our Manufacturing Division will give it prompt, individualized attention.



## VULCAN MANUFACTURING DIVISION

VULCAN COPPER & SUPPLY CO., General Office and Plant, ONE INDIAN LANE, OHIO

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VULCAN-VULCAN PROCESS ENGINEERING CO., LTD., MONTREAL, CANADA

DIVISIONS OF THE VULCAN COPPER & SUPPLY CO.

THE ENGINEERING DIVISION • VULCAN MANUFACTURING DIVISION • VULCAN CONSTRUCTION DIVISION • VULCAN INDUSTRIAL SUPPLY DIVISION

## MECHANICAL EQUIPMENT . . .

**Gland, Sealing**

For thermocouple.  
(200A)

. . . Thermocouple sealing gland permits changing exposed wire thermocouples without reducing pressure on system. C-U-P glands can seal several

thousand pounds per square inch. Temperature range is determined by the type of sealant selected for gland.—Conax Corp., Buffalo 21, N. Y.

**Glass, Oil Sight**

Shatterproof, for corrosion, stress applications.  
(200B)

. . . Oil sight glasses that withstand severe conditions are made from Kel-F plastic. They remain transparent indefinitely, survive severe corrosion, extreme temperatures, shock and vibration. Oils, sludges and acid products have no effect on glasses in range of

—65 to +300 F. Exceptionally high compressive strength and resiliency withstand strain from fully tightened mounting bolts. High impact strength prevents damage from tools or rough handling.—Nichols Engineering, Inc., Stratford, Conn.

**Idler, Belt Conveyor**

Has adjustable trough, models for fine and coarse materials. (200C)

. . . Variable-troughing belt conveyor idler provides smooth transition from troughing idlers to flat pulley. Angle of inclination of concentrator rolls is adjustable from 20 deg. to fully horizontal, permits belt to flatten gradually as it approaches the head pulley. Stresses are minimized and belt life is longer. Idler made in 2 types: Series 100—for belts carrying all but heaviest and coarsest materials and Series 200—for belts carrying heaviest and coarsest materials.—Link-Belt Co., Chicago 1, Ill.

**Idler, Belt Training**

Centers return belt run.  
(200D)

. . . Danger of conveyor belt damage from roving on return run is eliminated by positive aligning action of Style No. 4T belt training return idler. Idler consists of dead-shaft roller-bearing return roll. Roll ends are mounted in toggle-like arrangement of swivel arms suspended from conveyor framework at approximately 45-deg. angle in direc-

tion of belt travel. Lateral belt movement to one side results in increased weight on that side, causing that end of roll to move forward and downward. Opposite end moves backwards and upwards. Shift in roll position guides belt back to normal position keeping it from contacting frames.—Chain Belt Co., Milwaukee 1, Wis.

**Isolator, Vibration**

Cuts industrial noises.  
(200E)

. . . Type 915 Barrymount reduces vibration and structure-borne noise from grinders, motor-generator sets, high-speed compressors, fans and blowers. Within recommended load, unit pro-

vides 70 to 90% isolation at 30 cycles per sec. and more at higher frequencies. Lower effective limit is 20 cycles per sec.—The Barry Corp., Watertown 72, Mass.

**Jack, Hydraulic**

Operated by air motor.  
(200F)

. . . New type hydraulic jack uses air motor to drive pump of hydraulic system. Using air at 80 to 100 psi. the jack is said to save both time and labor. Air motor and pump are mounted on a portable buggy. A choice of four hydraulic rams can move

30 tons in any direction a distance of 2, 3½, 6 and 20 in. The pump, buggy and accessories weigh only 50 lb. An outstanding safety feature permits the operator to stand at a safe distance free of slippage.—Duff-Norton Mfg. Co., Pittsburgh 12, Pa.

**Locknut, Spin-Down**

Locks by shrinkage, lighter than common hexnut.  
(200G)

. . . Spin-down locknut applies permanent, vibration-proof grip only after nut actually contacts base material. This increases assembly speed of automotive and industrial equipment. At point of contact, ¼ turn takes up all play. As

nut is drawn tight, six threaded tines bite into bolt in shrinking action due to concave design. This locks nut securely. Locknut is ¼ lighter than common hexnut.—Thompson Breemer & Co., Chicago 10, Ill.

**Lubricators, Force-Feed**

Eliminate down-time, for applications to 30,000 psi.  
(200H)

. . . Models HP 20 and HP 30 force-feed lubricators provide continuous metered lubrication against high pressures. Used successfully for cylinder and bearing lubrication of compressors and lubricators. Lubricator consists of four integral sight-feed and pump as-

semblies mounted on a rugged cast iron reservoir. Pumping units are easily accessible and removable without disassembling the lubricator. Rate controlled by finger tip adjustment.—Frontier Industries, Inc., Buffalo 10, N. Y.



**Mover, Stationary Prime**

Heavy duty, moderate weight, small dimensions. (201A)

... Series of 4-cycle V-type engines for stationary services meets increasing demand for heavy-duty prime movers of moderate weight and small physical dimensions. Supairthermal engines are built with 12 or 16 cylinders covering range from 2,400 to 4,260 hp. at 450 to 600 rpm. Cylinder construction is simple. Units designed and built for

liquid fuel, dual-fuel or spark-fired gas operation. All the performance features of manufacturer's in-line engines have been incorporated in the new series. Many important parts are identical and interchangeable with the in-line type engine. Supairthermal engines are more powerful and efficient.—Nordberg Mfg. Co., Milwaukee, Wis.

**Muffler, Catalytic**

Overcomes diesel exhaust fumes. (201B)

... Harmful and unpleasant effects of diesel exhaust are largely overcome by the Dieseler catalytic muffler. Unit eliminates 65-85% of the irritating hydrocarbons and 80-90% of the carbon monoxide. Typical unit for tractor-shovel is a twin-flow, heavy-gage steel assembly containing eight catalytic sec-

tions with over-all dimensions of 7 x 12 x 27 in. Each catalytic unit contains 73 slender porcelain rods coated with alumina and platinum alloy. Hot gases flowing across these rods are catalytically burned to carbon dioxide and water vapor.—Oxy-Catalyst, Inc., Wayne, Pa.

**Oiler**

Delivers fine oil mist. (201C)

... A constant and uniform oil film is delivered to bearings in the form of mist by Oil-Air system. Oiling system has no moving parts; it operates solely on compressed air. System can be installed to deliver lubrication at any point either as completely atomized

oil, oil spray, or spray reconverted to liquid oil. Air at 100 psi. enters the unit through a regulator that reduces pressure to 10 psi. Passing through a venturi the air draws oil from a reservoir.—J. N. Fauver Co., Inc., Detroit 1, Mich.

**Protector, Chain-Drive**

Trips limit switch, operates at chain tension to 1,000 lb. (201D)

... Overload protector guards mechanical, chain-drive systems against sudden temporary overload. In case of excessive chain tension on drive leg, protector trips limit switch stopping the drive. Overload Protector is an eccen-

trically located idler-sprocket counter-balanced by weight-loaded arm. Unit used with chain sizes from  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. Electrical capacity of limit switch is 10 amp. at 115 v. a.c.—Lamson Corp., Syracuse 1, N. Y.

**Reducer, Speed**

Mounts on driven shaft. (201E)

... A new speed reducer mounts directly on the shaft to be driven. Only sufficient floor space is needed for the motor and tie rod connection. Reducer easily adapts to various shaft diameters. Choice of single or double reduction unit makes possible the selection of

almost any desired output speed between 420 and 14 rpm. Six sizes cover the range from  $\frac{1}{2}$  to 30 hp. Construction of reducer is all-steel with highly efficient helical gearing and positive lubrication.—Falk Corp., Milwaukee, Wis.

**Reducer, Speed**

Slips onto motor shaft. (201F)

... Model 3R3 Uni-Reducer slips onto motor shaft, eliminates usual coupling between shaft and reducer. It converts electric motors to geared motor type reducers at minimum cost. Unit is designed to fit standard motors from

1 to 5 hp., 1,800 rpm., and 1 to 3 hp., 1,200 rpm.; has reduction ratio of 3.04 to 1. Torque arm take-up eliminates the need for having slide rails.—Turner Uni-Drive Co., Kansas City, Mo.

**Rings, Backup**

Teflon, prevent extrusion of O-rings. (201G)

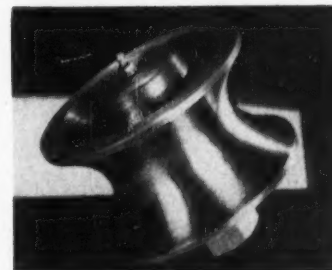
... Backup rings, spirally machined of Teflon are designed to prevent extrusion of O-rings. Backup rings have high impact strength at temperatures from -100 to +500 F. Rings are

non-corrosive, non-adhering, non-fraying, inert to chemicals, self-lubricating. They are made for all O-ring sizes to AN drawings 6227, 6230.—The Garlock Packing Co., Palmyra, N. Y.

**Roll, Idler**

Guides conveyor belts, eliminates rips and tears. (201H)

... Guidler rolls, installed along conveyor belt edges, reduce side-to-side movement under uneven loading conditions. When properly installed at 30-deg. angle, Guidler presents a revolving hyperbolic face to belt edge. Force of impact on roll is distributed over long flat surface, avoiding injury to belt edges. The roll also moves along its axis following vertical movements of belt edge. Ripping and fraying of the belt are eliminated.—Knapp Mills, Inc., Long Island City, N. Y.



## MECHANICAL EQUIPMENT . . .

**Seal**

Stops bolt leakage at high or low pressure. (202A)

. . . Safe, sure sealing of bolts and studs at high or low pressure is provided by the Stat-O-Seal. Device eliminates need for goop over bolts and studs. Seal is effective for gas, liquid

or air. Stat-O-Seal always gives full metal-to-metal contact without transference of load to sealing gland.—Franklin C. Wolfe Co., Culver City, Calif.

**Seals, Metallic**

In miniature size, corrosion resistant. (202B)

. . . Toruseals meet industrial demands for miniature, extreme temperature and high pressure, corrosion-resistant seals. Seals come in sizes from  $\frac{1}{8}$  to 1 in. O.D.; can be used in small hydraulic,

pneumatic and steam lines. They work well at temperatures from  $-150$  to  $+1,000$  F. and are adaptable to bolt heads, flanges, rivets.—The D. S. D. Mfg. Co., Hamden, Conn.

**Sheave, Variable-Pitch**

Maximum hp. through single wide belt. (202C)

. . . For drives in the 5 to 20 hp. range a variable-pitch sheave offers many speed-adjustment advantages. Use of a single wide belt with notched construction gives maximum hp. efficiency. Speed can be varied over a 3:1

range. A single adjusting screw is easily accessible at either end of the sheave. Rotation of screw moves both flanges simultaneously to vary sheave pitch.—T. B. Woods Sons Co., Chambersburg, Pa.

**Turbines, Horizontal**

Have more power. (202D)

. . . DH horizontal turbine boasts from 50 to 100% more power on all models. Increase due to adding one steam nozzle to both one-nozzle and two-nozzle machines. Larger, improved carbon-ring packing glands increase maximum back-pressure from 50 to 75 psi.

Also, redesign has eliminated need for packing on valve stems for high-pressure and high-temperature units. One of the models now is equipped with water-cooled bearings for high temperature.—Dean Hill Pump Co., Indianapolis 7, Ind.

## • Packaging and Handling Equipment

**Assemblies, Gas Transport**

For oxygen, hydrogen, nitrogen. (202E)

. . . Gas transport assemblies come completely assembled to meet ICC specifications and any particular state road limitations. Standard assemblies contain thirty 20 $\frac{1}{2}$  ft. high-pressure

cylinders for transportation of oxygen, hydrogen, nitrogen. Other gases can be transported; other sizes are available.—Taylor-Wharton Iron and Steel Co., Cincinnati 12, Ohio.

**Assemblies, Lift Truck**

Expedite high stacking of heavy loads in low headroom area. (202F)

. . . Mast and lifting cylinder assembly developed for installation on large capacity units now available on all three capacities of Towmotor Model LT-35 lift trucks. Assembly eases high stacking of heavy loads in low head-

room areas, providing high free lift at lowest over-all truck height. It's interchangeable with standard masts, but affords more free lift and total lift for any given mast height.—Towmotor Corp., Cleveland 10, Ohio.

**Bagger**

Packs free-flowing solids, lowest cost of its type on market. (202G)

. . . Free-flowing non-bridging solids are packed in record speed with Inglett and Corley bagger. Actual installations have packed 100 lb. open-mouthed multi-wall bags at rate of 18 to 20 per min. Machine is easy and

quick to install, requires minimum repair. It works well on all types of open-mouthed bags. Product can be pre-weighed, packed and bag sewn closed with only two operators.—Union Bag & Paper Corp., New York 7, N. Y.

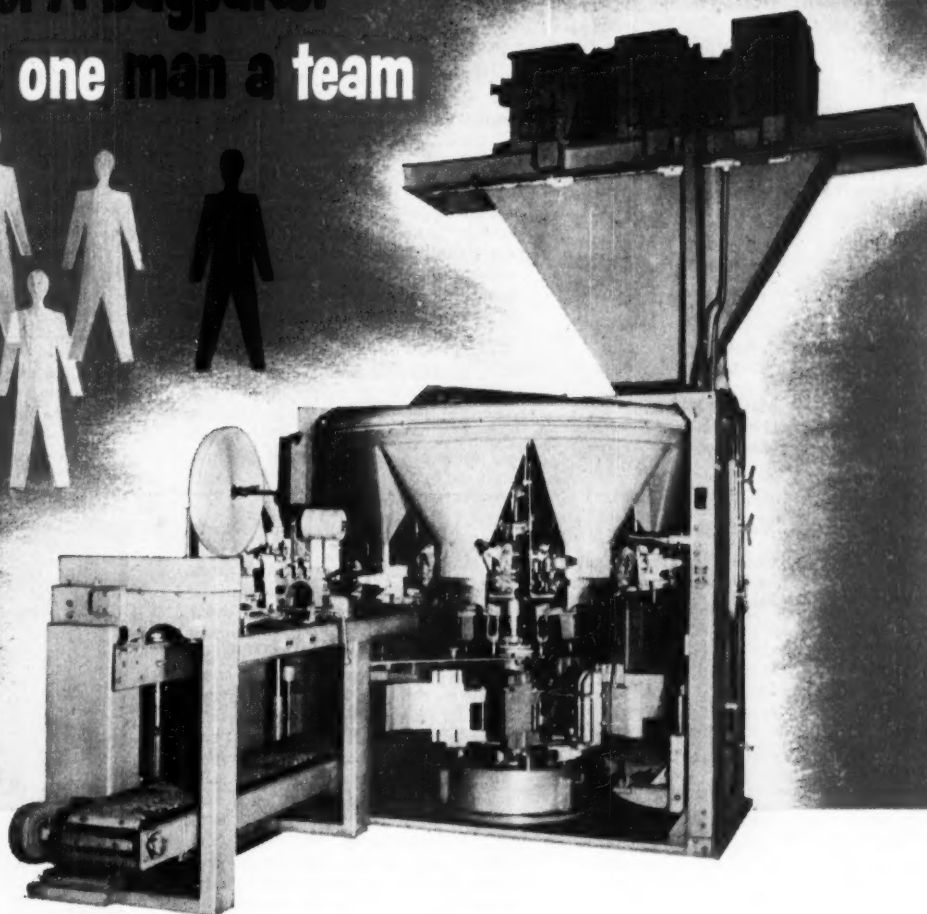
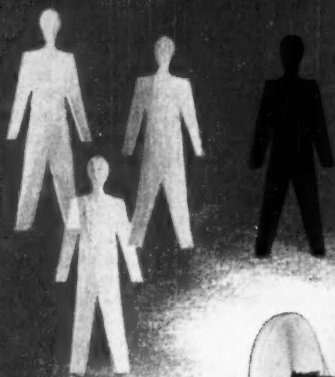
**Cap, Oil Storage Vapor**

Cuts vapor loss 90%. (202H)

. . . Microballoon vapor barrier cuts evaporation loss from crude oil storage by 80 or 90%. Consisting of tiny, hollow, phenolic resin spheres the Microballoons are installed by mixing with the oil and pumping into the tank. A layer  $\frac{1}{8}$  to 1 in. thick will do the job. Savings will pay for cost within year. Service life will be adequate to repay initial cost several times over.—Bakelite Co., Div. of Union Carbide & Carbon Corp., New York 16, N. Y.; The Colton Chemical Co., Cleveland 14, Ohio.



# Model A Bagpaker<sup>®</sup> makes one man a team



The Model A Bagpaker<sup>®</sup> makes large tonnage bagging of free flowing materials a one man operation—and up to 350 tons can be bagged per 8 hour shift without overtime.

All the operator does is hang the empty bags on the filling spouts. Accurate weighing, filling, settling and sewing are fully automatic.

Engineered and manufactured by Bagpak Multiwall Bag experts, the Model A Bagpaker<sup>®</sup> is designed for reliability and durability. It can be depended upon to give years of service—and to pay for itself in as little as one year. If you are interested in the utmost in economy and efficiency in packaging bulk materials, you'll want to have all the details on this on this efficient machine. For complete information on how the Model A can fit into your packaging picture write to: E-17

International Paper Company, Bagpak Division  
220 E. 42 Street, New York 17



## International Paper COMPANY

BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston • Chicago • Cleveland • Dallas • Denver • Des Moines • Detroit • Kansas City, Kansas • Los Angeles • Louisville • Minneapolis • New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

## PACKAGING AND HANDLING EQUIPMENT . . .

**Car, Covered Hopper**

Unloads by fluidization.  
(204A)

. . . Dry solids—powdered or granular—shipped by covered airslide freight cars. Loading done through watertight roof hatches. Hopper sections consist of 2 trenches running full length of car on both sides of center sill. Under-side of each trench covered by silicone-treated fabric enased in U-section of

light gage steel. Section acts as chamber to direct low-pressure air through fabric during unloading. Air fluidizes lading. Cars made in 3 sizes 2,000, 2,600 and 3,600 cu. ft. capacities. Air for slide should be supplied at 1 psi. and 200 cfm.—General American Transportation Co., Chicago 90, Ill.

**Carrier, Bottle**

Eliminates danger in transporting acid bottles.  
(204B)

. . . Agile bottle carrier eliminates danger associated with carrying large acid bottles. Made of corrosion-resistant polyethylene it is light-weight and unbreakable. Cover fits snugly to hold bottle safely in position even when tilted for pouring. Bottleneck extends

through hole in top of cover. An over-size carrier can be used for transporting iced samples of monomers or reagents. Excess space between the sample bottle and the wall of the carrier can be filled with cooling mixture.—American Agile Corp., Bedford, Ohio.

**Coder**

Marks package tops, readily installed on any conveyor.  
(204C)

. . . Economical fast coding of packaged materials is accomplished with coding and printing machine. Machine will mark at rate of 1 to 90 packages per minute. User can adjust machine

within seconds to mark at the proper height and location. Near perfect registration is attained by adjusting type on printing wheel.—Algene Marking Equipment Co., Garfield, N. J.

**Container, Collapsible**

Greater chance of payloads both ways, saves shipping space.  
(204D)

. . . Mick 7, general purpose metal collapsible container, can be used to ship solids, liquids or package goods. There's no danger of contamination between successive lots of entirely different kinds of commodities, thus upping chances for two-way payloads. Despite its bulk capacity, container will knock down to collapsed volume that's only 38% of working volume. This cuts shipping costs on return of empty containers. Mick 7 consists of six panels. Four are hinged to each other by piano type hinges. The other two form hinged, gasketed removable doors. When doors are in place they complete a rigid, rugged, water-proof structure able to withstand hard usage. Construction can be either steel or a light alloy.—American Premaberg Co., New York 18, N. Y.

**Container, Corrugated**

1,000 lb. package for plastic pellets.  
(204E)

. . . Corrugated fiber container now used for plastic pellets has reduced costs of initial package, storage, and materials handling. Holding 1,000 lb. the octagonal box measures 33 in. across flats by 41½ in. high. It consists of an inner body, the bottom lid into

which the inner body slips, the outer body which telescopes over bottom lid and inner body, and the top lid that fits over the outer body. Assembled boxes are palletized before the filling operation.—Gaylord Container Corp., St. Louis 2, Mo.

**Containers, Shipping**

Nest when empty.  
(204F)

. . . By nesting into each other when empty NESTA-Bin containers occupy only 1/10 of their normal full space. Designed for shipment of liquids, powders, pastes or granules they can be furnished with rubber or plastic linings, if desired. Bins are made with identical

half-sections that are joined by means of cam fasteners to form an airtight seal. Airtight doors are located in each end. Assembled bin rests on base. Three basic models have capacities of 42, 58 and 70 cu. ft.—Nesta-Bin Co., Denver, Colo.

**Conveyor, Bag Packing**

Ups packing rate; handles flour, mashes, bulky materials.  
(204G)

. . . Two men can equal bag packing rate of three or four men through use of Y-shaped conveyor. Conveying system consists of two 3-ft. spiral conveyors arranged as arms of a Y and specially designed 7-ft. 3-in. V-belt sewing conveyor which forms leg of Y.

Key feature of system is controlling mechanism located at receiving end of sewing conveyor. It prevents spilling, tipping or twisting of filled open bags as they pass from spiral conveyors to V-belt conveyor.—Richardson Scale Co., Clifton, N. J.



**Conveyor, Bucket**

Keeps buckets upright.  
(205A)

... Patented Stif-Arm bucket hanger design is claimed to lower conveying costs for bucket trolley conveyor. Conveyor trolley is a single I-beam. A universal chain with standard roller attachments runs parallel to the I-beam. Stif-Arm bracket brace holds the bucket trunnions at a fixed distance away from the trolley chain and beam.

Thus the buckets cannot swing loosely against chain while making vertical or inverted runs. Instead they remain upright at all times. Thus a single conveyor with single drive can be used for multiple-plane path eliminating numerous transfer points. Simplicity of single units lowers cost.—Hapman Conveyors, Inc., Kalamazoo, Mich.

**Conveyor, Bulk**

Moves solids economically.  
(205B)

... Continuous delivery of dry granular bulk materials provided by Flow-master dust-tight conveyor. It is enclosed, endless chain with special flights; moves materials horizontally, vertically,

or along inclines. Unit is adapted to medium and low-capacity operations. It can be designed into tight spaces and around existing equipment.—Gifford Wood Co., Hudson, N. Y.

**Conveyor, Pneumatic**

Under negative pressure, material doesn't pass through fan.  
(205C)

... Pneumatic conveying unit for bulk materials operates by negative pressure. Fan is located on opposite side of collector from conveying line. Collector cone has high efficiency fan mounted

on top and rotary-vane feeder valve at base. Unit is self-cleaning. Pneu-Vac conveyor is built in 12 sizes with fan motors from 2 to 60 hp.—Sprout, Waldron & Co., Inc., Muncy, Pa.

**Conveyor, Unloading**

Flattens bags in transit.  
(205D)

... Adaptable for unloading either box cars or trucks, modified conveyor has a bag-flattening attachment. Bags are carried along a flexible spring conveyor through a hugger-boom section where

they are flattened for storage in minimum space. Discharge end is raised or lowered by hydraulic jack when loading to pallet.—Flexveyor Mfg. Co., Denver 10, Colo.

**Conveyor, Vibrating Trough**

Screens and conveys simultaneously.  
(205E)

... Bulk materials can be conveyed, screened, or conveyed and screened using the Balanced Dual-Trough vibrating conveyor and screen combination. Two troughs or screens or one of each are mounted one above the other and connected by leaf springs. The entire

assembly mounted on guide links follows the movement of the eccentric. Conveyor has low power requirement. Amplitude of vibration is  $\frac{1}{4}$  in. and frequency is 1,000 per min. Available with capacities of 80 and 280 tons per hr.—Syntron Co., Homer City, Pa.

**Crane, Mobile**

Works indoors or outdoors, self-propelled, light weight.  
(205F)

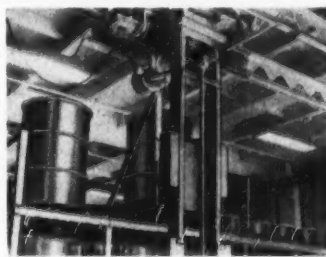
... Adapted from machine originally designed for Navy, hydraulic crane combines best features of crawler, industrial shop crane and truck and erection cranes. Crane can perform four

functions: turntable rotation, boom elevation, raising and lowering of cable and hook, and power extension and retraction of the boom.—Austin-Western Co., Aurora, Ill.

**Crane, Stacker**

Uses fork lift, mast rotates full 360 deg.  
(205G)

... Advantages of overhead crane suspension are combined with fork lift principle in Trambeam stacker crane. Crane is designed primarily to expedite handling of drums, motors, chemicals, paints, naval stores. Stacking mast, with its fork lifts, is rigidly suspended from double girder crane. Mast rotates a full 360 deg. Lifting power supplied by double drum hoist. Crane motion can be hand powered or motor driven.—Whiting Corp., Harvey, Ill.

**Crock, Chemically Resistant**

Made of plastic laminate; won't break.  
(205H)

... Cocks made of Iolyte, a fiberglass-reinforced polyester laminate, are available in sizes from 5 to 125 gal. capacity. Cocks are chemically resistant and can-

not break or crack. They are cylindrical without any taper, and are inexpensive.—Schori Process Div., Ferro-Co Corp., Long Island City, N. Y.

**Dome, Vapor**

No venting cuts storage loss.  
(205I)

... Vapor losses from bulk storage tanks are drastically reduced through use of expansion chambers to absorb surges in vapor volume. Devices can be incorporated in storage tanks for crude oil, petroleum fractions, commercial solvents. Dome contains flat

flexible membrane which is raised or lowered by changing gas volume. Three dome variations are the Hortondome, Vaporsphere (spherical steel shell) and Horton Vaportank (flat bottom steel tank with dome roof).—Chicago Bridge & Iron Co., Chicago 4, Ill.

**PACKAGING AND HANDLING EQUIPMENT . . .**

**Drop, Powerless Load**

Lowers and discharges loads automatically. (206A)

. . . Powerless Drop lowers cylindrical loads automatically between floors and discharges them. Depends upon counterweight and does not require any power supply. Handles drums, barrels,

rolls of paper, cloth and rubber. Rate of descent is controlled by rate of air bleed from air snubbing cylinder where it is compressed by counterweight.—*Gifford-Wood Co., Hudson, N. Y.*

**Drum, Collapsible**

Made of rubber in sizes up to 2,500 gal. (206B)

. . . Collapsible rubber containers for flowable solids are tough, non-corrosive, vermin-proof, light weight. Containers are leakproof and can be pressurized

with inert gases to protect air-sensitive ladings. They can be handled by crane, hoist, fork lift.—*U. S. Rubber Co., New York 20, N. Y.*

**Drum, Polyethylene**

Lightweight, shatterproof container. (206C)

. . . Light-weight shatterproof shipping drum is one-piece-molded polyethylene that fits standard fiber, plywood and steel overpacks. Drums are suitable for such powerful industrial acids as muriatic and hydrofluoric, caustic soda solutions and electrolyte fluids. They are reusable without reconditioning. Open-

ings in the drums are made of two heavy-duty polyethylene flanges threaded for  $\frac{1}{2}$  or 2 in. screw caps. Sizes are 5, 15, 30 and 55 gal. The 55-gal. size weighs  $\frac{1}{4}$  as much as 4 carboys. Weight savings on all sizes mean savings on freight costs. — *Delaware Barrel & Drum Co., Wilmington, Del.*

**Dumper, Rotary**

Slips onto truck forks. (206D)

. . . Rotary dumping mechanism slips readily onto truck forks. Conversion of truck from fork to dumping operation is done in less than 20 min. Dumping action permits forward rotation of

190 deg. Truck's permanently attached forks are hydraulically adjustable. Thus large or small objects can be picked up and held by clamping.—*Automatic Transportation Co., Chicago 20, Ill.*

**Elevator, Carbide**

Simplifies recharging of acetylene generator. (206E)

. . . A special carbide screw elevator efficiently recharges large double-hopper acetylene generators. It provides a smooth, dependable flow of carbide from the storage room to the hopper. When the hopper is full a current type

relay automatically shuts off the power. Vent on the screw housing provides an automatic safeguard. Air is excluded from the generator hopper during recharging.—*Linde Air Products Co., New York 17, N. Y.*

**Engine, Switch**

Drawbar pull of 7,500 lb. (206F)

. . . Secret of Hemo-Motive's large pulling capacity lies in transferring some of car weight onto Hemo-Motive for increased traction. This is done by use of a hydraulic weight-transfer cylinder. Unit develops drawbar pull of 7,400 lb. Under average conditions, this is sufficient to propel three fully loaded or 6 to 8 empty cars at a speed of 150 fpm. Operator has full visibility down length of train.—*Hemco Mfg., Inc., Argonia, Kans.*



**Fork Truck, Attachment for**

For dumping drums by fork lift trucks. (206G)

. . . Fork lift truck attachment lifts and carries drums then up-ends the drum for dumping. Clamping, lifting and dump-

ing are controlled by operator from driving position.—*Lewis Shephard, Watertown, Mass.*

**Fork Truck, Attachment for**

Dumps contents of drop-bottom boxes. (206H)

. . . Fork-truck hydraulic attachment permits controlled dumping of drop-bottom boxes handling bulk materials. Operation can be done at any height up to the maximum lift range of the truck without loss of lift. A hook engages the rear end of the box raising it

independent of fork action. Forks and front of box bottom are at same height while dumping the load. Device attaches easily and quickly to the truck. Lifting hook is adjustable for both 11 and 15 cu. ft. boxes.—*The Yale & Towne Mfg. Co., Philadelphia, Pa.*

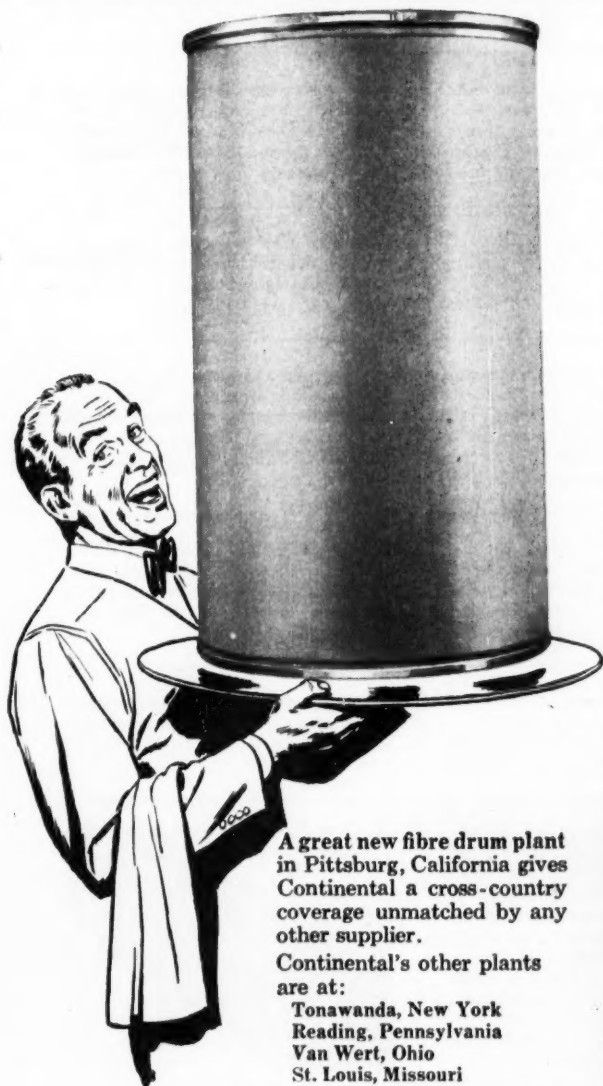
**Grate, Magnetic**

Removes tramp iron; uses Alnico B magnet castings. (206I)

. . . Permanent non-electric grate magnet removes tramp iron from free-flowing materials. Unit fits hoppers, floor openings or vertical closed chutes. Grate has 1-in. dia. stainless-steel tubes within which are powerful Alnico B magnets. Rugged steel grille acts as

baffle to slow down materials and direct flow onto magnetic tubes. When grate is ready to be cleaned of tramp iron, grille is lifted from its working position. Units are available up to maximum of 36 $\frac{1}{2}$  in. wide and 36 in. long.—*Eriez Mfg. Co., Erie, Pa.*

# Continental's formula for drumming up business: **SERVICE**



A great new fibre drum plant in Pittsburg, California gives Continental a cross-country coverage unmatched by any other supplier.

Continental's other plants are at:

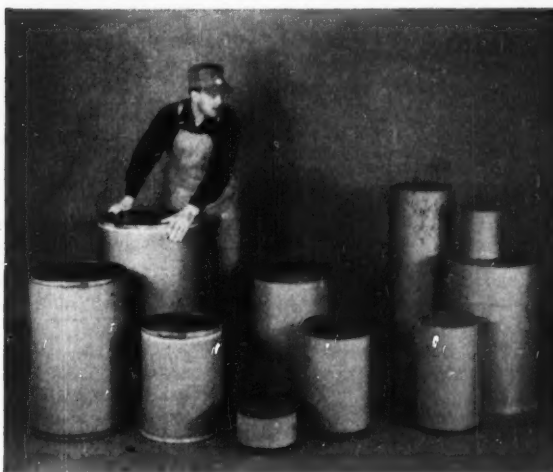
Tonawanda, New York  
Reading, Pennsylvania  
Van Wert, Ohio  
St. Louis, Missouri

From the wide variety of Continental fibre drums, you choose the size and style Tailor-Made for your product. Three bump-resistant, sure-locking, easy-opening styles: Leverpak, Stapak, Fiberpak. Your choice of many sizes, 17 different colors, 14 different inks. Special protective linings available for all of them.

You get more than lightweight, sturdy packaging when you buy Continental fibre drums. You get the *service* of Continental's nation-wide fibre drum division.

That means you have at your command Continental's experienced packaging engineers in twelve cities scattered all over the country. You have the use of Continental's research facilities. We will help you to test your packaging methods, to improve your old system or to establish a new and better system. We will help you to crack tough packaging "nuts". And don't forget Continental's quick deliveries to any point in the United States from our five fibre drum plants.

Call on Continental for packaging advice and efficient service!



## CONTINENTAL © CAN COMPANY

FIBRE DRUM DIVISION • VAN WERT, OHIO



NEW YORK • PHILADELPHIA • PITTSBURGH, PA. • TONAWANDA • CLEVELAND • CHICAGO  
ATLANTA • ST. LOUIS • SAN FRANCISCO • LOS ANGELES • EAU CLAIRE • PITTSBURGH, CALIF.

**PACKAGING AND HANDLING EQUIPMENT . . .**

**Liner, Double-Wall Drum**

Provides air cushion in steel or fiber drum.  
(208A)

. . . An easier ride and added protection for drum contents can be provided with a double-wall polyethylene drum liner. Enclosed between liner walls is an insulating and cushioning air space. Transparent double wall increases

strength of liner and distributes shocks and pressure. Liner is suitable for liquid or solid materials. It can be used for transporting acids, alkalis.—*Mehl Mfg. Co., Div. of Sydney-Thomas Corp., Cincinnati 2, Ohio.*

**Loader, Attachments for**

Five attachments for versatility.  
(208B)

. . . Scoopmobile front end loaders have five new attachments: lift forks, back-fill blade, crane boom, concrete hopper and dozer blade. Attachments increase versatility of four-wheel drive and four-

wheel power-steer loaders. Units used in construction, lumbering jobs. Attachments eliminate need for extra equipment on job.—*Mixermobile Manufacturers, Portland 20, Oregon.*

**Loader, Four Wheel Steering**

Can cut sharp corners.  
(208C)

. . . Shovel loader, despite an over-all length of 19 ft., has an inside turning radius of only 7 ft. 6 in. It uses same steering principle as hook and ladder

fire truck. Unit is equipped with positive four-wheel drive. Power steering is optional feature.—*Baker-Lull Corp., Minneapolis, Minn.*

**Machine, Can Filling**

Two-line, fully automatic.  
(208D)

. . . Fully automatic, two-line filling machine fills one-half pint, quart and gallon cans. It can handle paint, oil, chemicals, and similar viscous products. Production is from 20 to 50 cans per min. Only one operator is needed. Lids

are dispensed and placed firmly following the filling operation. All contact parts are bronze but stainless steel can be furnished on request.—*The Filler Machine Co., Inc., Philmont Club Station, Pa.*

**Machine Filling**

Handles 15 different bottles.  
(208E)

. . . Simplex automatic filling machine can handle 15 different bottle styles. Advantage: increases production without increasing labor. Machine handles soft soap, paste, medicine, wax, cos-

metics, grease, ink, paint, etc. Filling rate is 20 to 60 containers per min. Product can be fed to filler direct from kettles or hoppers.—*F. L. Burt Co., San Francisco 3, Calif.*

**Machine, Filling**

Displaces trapped air with nitrogen.  
(208F)

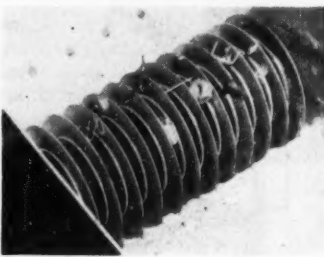
. . . Filling machine displaces trapped air in filled containers with nitrogen to prevent spoilage of contents. Machine will handle containers from 1 oz. to

several gallons. Loss of nitrogen is minimized. Pressure shuts off automatically when machine stops.—*M. R. M. Co., Inc., Brooklyn 11, N. Y.*

**Magnet, Hopper**

Traps tramp metal ahead of bagger.  
(208G)

. . . Permanent non-electric hopper magnet fits mouth of automatic bagging scale. It catches and holds any tramp metal in the downflowing stream. It is built of 6-in. dia. circular magnetic disks spaced at 1-in. intervals on a magnetic core. Constructed in 1-in. increments unit can be built to any width desired. Iron accumulations are removed simply by lifting magnet from the hopper and wiping it clean with a cloth.—*Eriez Mfg. Co., Erie, Pa.*



**Muffler, Fork Truck**

Kills noxious fumes by catalytic combustion.  
(208H)

. . . Catalytic treatment renders harmless the fumes from gasoline engine exhaust. Use of OCM catalytic exhaust system permits fork lift trucks to operate with complete safety in confined plant areas. It also prevents contamination of foodstuffs and other perishables that might be tainted by fork truck exhaust. Heart of exhaust system

is Oxycat, a cartridge of spaced porcelain rods coated with catalytic alumina and platinum alloy. Engine exhaust flows across surface of rods where combustion of carbon monoxide and other harmful vapors takes place. On leaving the catalyst the exhaust contains mostly carbon dioxide and water vapor.—*Oxy-Catalyst, Inc., Wayne, Pa.*

**Plant, Compounding**

Blends and packs powders.  
(208I)

. . . Developed primarily for blending and packing soap and detergents, R. T. R. Uniblender compounding plant can be used for similar dry product operations. Plant includes  $\frac{1}{2}$ -ton skip loader, 56-cu ft. ribbon mixer with up to 2,000

lb. capacity, gyratory sifter for removal of over-size and foreign particles and bagging hopper and scale. Motor and drives are included; unit is completely wired, ready to run.—*A. E. Poulsen & Co., Los Angeles, Calif.*



**Platform, Unloading**

Column-mounted, swings over tank cars. (209A)

... Column-mounted platform swings over tank car giving easy access to dome. Operator need not leave platform during loading or unloading. From grated deck, operator can turn platform 360 deg., stopping at any angle over tank car top. Hook up for loading or unloading made when platform is in

position. Platform balances and rides on roller bearings, is turned by crank wheel geared to supporting steel column. Operator must depress foot-brake lever before turning platform. When not in use, platform can be locked in safe position parallel to tracks.—*Nichols Engineering Co., Chicago, Ill.*

**Pulley, Magnetic**

Small size has beefed-up strength. (209B)

... A 4-in. dia. permanent magnetic pulley tests as strong as units twice its size. Pulley is designed for conveying systems where belt thicknesses are  $\frac{1}{4}$  in. or less and speeds under 30 fpm. Pulley

has a peripheral magnetic field running completely around the surface parallel and circumferentially to the shaft. Shaft and pulley can be stainless.—*Eriez Mfg. Co., Erie, Pa.*

**Rack, Drum**

Loaded by one man, for drums up to 750 lbs. (209C)

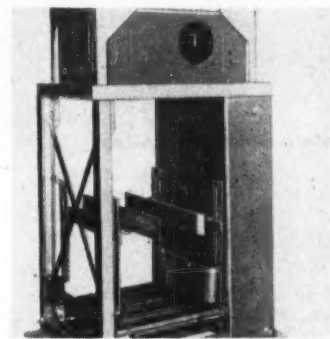
... Drums weighing up to 750 lb. can be horizontally rack-mounted by one man without strain or risk of injury. To use, place rack alongside drum. Two drum hooks are hooked over top chime

of drum and drum is tilted into position. Rack has telescoping steel handle for increased leverage and stability in handling.—*Baker-Roos, Inc., Indianapolis 6, Ind.*

**Scale, Automatic Checkweigh**

Protects producer and customer. (209D)

... Checkweigh scale, model 100S, protects against shipment of either under—or overweight packages. It can be installed between the filling machine and the sewing machine in the case of bagged products. Conveyor on scale platform takes bag from delivery conveyor and centers it on scale. Weight is shown on large dials. If properly filled the bag is discharged. If not a horn sounds and the bag can be removed either by hand, by manual control of the conveyor or by manual pick-up after automatic discharge. Handles bags from 10 to 100 lb.—*Thayer Scale & Engineering Co., Rockland, Mass.*

**Scale, Pneumatic**

For batch, continuous processing. (209E)

... Pneumatic weighing scale for batch or continuous processes operates without springs, knife edges or lever system. Scale is completely pneumatic utilizing force-balance principle. No electricity

is needed even for remote indications or control. Scale operates on an air supply with a minimum pressure of 50 psi.—*Weighing Components, Inc., Hatboro, Pa.*

**Scales, Production**

Weigh and load dry solids at high rate. (209F)

... A unique feeding mechanism and a reliable shockproof leverage system enables filling scales to handle high tonnages. Available either for gross or net weighing, scales can handle flake, granular, pelletized or fibrous materials. Feeder can be attached directly to a

storage bin or surge hopper. Right-angle conveying through feeder prevents head pressure changes from altering weighing accuracy. Rapid adjustments can be made to compensate for variations in product density.—*Thayer Scale & Engineering Co., Rockland, Mass.*

**Shovel, Tractor**

Heavier, more powerful line. (209G)

... Line of "front-end-loading" tractor shovels has six models. Three major designs offer a combination of 2 or 4 wheel drive with rear or bucket-wheel steering. Capacities range from 15 cu ft. to 24 cu. yd. Torque-converter transmission has 3 to 1 torque multiplication factor. Steering boosters are stand-

ard. Based on rated capacity the Michigan tractor shovel is heavier and more powerful than other comparable equipment. Design features easy accessibility to all major components. Any component can be removed without disturbing other components.—*Clark Equipment Co., Buchanan, Mich.*

**Shovel, Tractor-Mounted**

Has long reach; load capacity to 6,000 lb. (209H)

... Possessing vertical reach of 16 ft., High Lift Shovel loader is designed for loading bulk materials into gondola cars, hoppers, trucks. Unit has load capacities as high as 6,000 lb. and will dump at heights up to 14½ ft. Double-

acting hydraulic cylinders enable operator to shake bucket while in dumping position. All actuating parts of equipment are well ahead of operator for maximum safety.—*Baker-Lull Corp., Minneapolis 20, Minn.*

**PACKAGING AND HANDLING EQUIPMENT . . .**

**Stabilizer, Load**

For speedy skid handling without spillage. (210A)

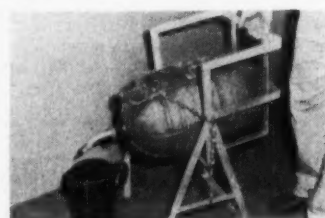
... Speedy and efficient skid handling without fear of spillage is assured through use of a lift truck with load stabilizer. Any load carried by the truck rides on a platform with another overhead platform acting to hold it in place. Inverted platform has a lowered

height of 41 in. and a raised height of 67 in. To prevent crushing during lowering of the stabilizer, an adjustable pressure relief valve is incorporated into the hydraulic system. Surface of the platform is covered with sponge rubber. —Lewis-Shepard, Watertown, Mass.

**Stand, Pouring**

Eliminates spilling and splashing. (210B)

... Liquid chemicals in 5 and 6½ gal. containers can be handled safely with pouring rig. Device holds container in position for easy pouring. Smooth discharge is assured by the pouring spout made of acid-resistant rubber and plastic tubing. Spout fits openings from 1 to 1½ in. Flow capacity is slightly more than 1 gpm.—General Scientific Equipment Co., Philadelphia 32, Pa.



**System, Automatic Weighing**

Instrumented for hairline control. (210C)

... Automatic tare-weighing system uses advanced instrumentation to bring hairline control to weighing and filling operations. Product container is tared automatically, then filled with product until a selected weight is reached. Precise product weight in the container

is recorded or printed. Accuracy of the system rests on use of military type synchro-mechanism transducers which cancel the unbalance in an electrical circuit created by the weight of the empty container.—Richardson Scale Co., Clifton, N. J.

**Tanks, Aluminum Alloy**

For storage at atmospheric and low pressures. (210D)

... Aluminum alloy tanks manufactured as standard items for storage of materials at atmospheric or low pressures. This cuts delivery time up to 80%. Cost of materials and labor is lower. Tanks furnished in capacities

from 5,800 to 16,400 gal. in both horizontal and vertical types. While some gage pressure can be applied to tanks, tank position and weight of contents must be known.—Aluminum Co. of America, Pittsburgh 19, Pa.

**Tank, Plastic Semi-Trailer**

First in U. S., lower initial cost, increased payloads. (210E)

... With road tests completed, over-the-road haulage of bulk liquid chemicals is being handled with plastic, oval-shaped trailer-mounted tank. Constructed of Laminac polyester resin and fibrous glass molded in one piece, tank has 3,400 gal. capacity, weighs only 7,025 lb. (3,600 lb. less than compara-

ble steel tank). Weight saving means increased yearly payload. Savings on initial investment are due to fact that tank requires no special lining. Tank body is highly resistant to corrosion. Tanks are made by Beetle Plastics Corp., Fall River, Mass.—American Cyanamid Co., New York 20, N. Y.

**Tanks, Portable**

For shipping bulk fluids. (210F)

... Portable tanks—midway in size between steel drums and tank cars—for economic handling of lading too large for drums, too small for tankers. Tanks can be emptied and returned immediately or held in storage until contents needed. Most tanks leased from

owner, regular service inaugurated on tariff basis. Cost of 3,000 to 4,000 gal. tanks: \$25 to \$30 a month. Small tanks: \$5 to \$7 a month. Charges depend on quantity leased, lease period, depreciation, wharfage, etc.—Transit Tank Co., Richmond, Calif.

**Tank, Trailer-Mounted**

Transports liquid oxygen, high thermal efficiency. (210G)

... Liquid oxygen and nitrogen transport container mounted on semi-trailer operates with minimum evaporation loss under all conditions. Will withstand severe shock loads even when operating over roughest terrain. Semi-trailer consists of liquid oxygen storage vessel and outer shell which also func-

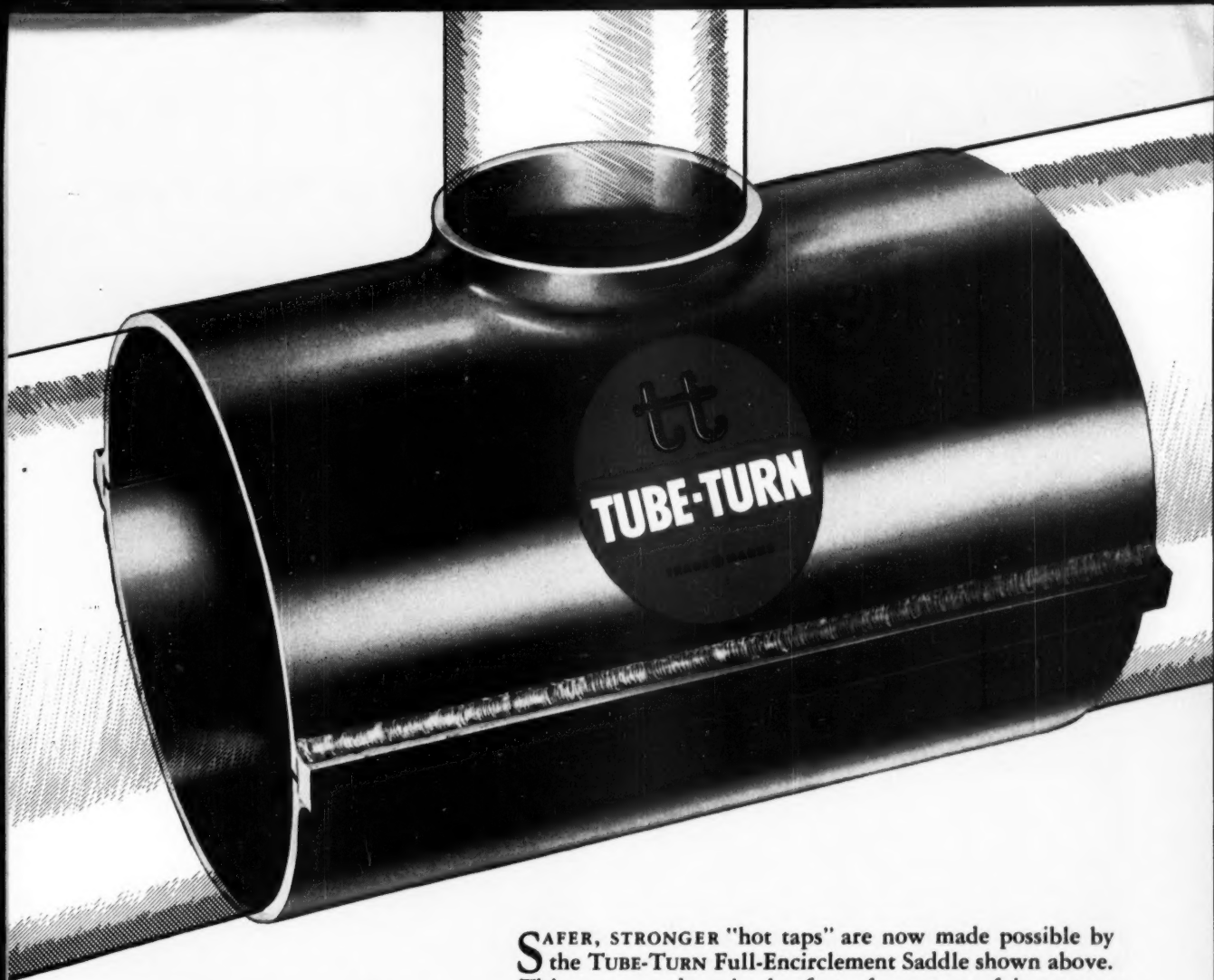
tions as part of the chassis. Vacuum space between walls maintains high thermal efficiency. Vacuum pump keeps space evacuated despite outgassing. Transfer of liquid oxygen is handled by electrically-driven centrifugal pump at rate of 100 to 150 gpm.—Hofman Laboratories, Inc., Newark, N. J.

**Trap, Magnetic**

For slurry lines, collects tramp iron. (210H)

... Magnetic trap, originally designed for removal of tramp iron from paper stock, now used wherever there's danger of metallic contamination inclusions. Unit must be installed in a section of vertical down pipe. Position takes advantage of gravity to drive ma-

terial containing tramp iron directly onto magnet face. Unit consists of cylindrical housing, supplied by customer, with inlet at top and outlet at bottom. Traps available to accommodate flow rates from 1,500 to 5,000 gpm.—Eriez Mfg. Co., Erie, Pa.



# NEW!

## **TUBE-TURN Full- Encirclement Saddle improves "hot-tapping" of piping**

**S**AFER, STRONGER "hot taps" are now made possible by the TUBE-TURN Full-Encirclement Saddle shown above. This new product is the first of a group of important developments of Tube Turns' unique pulsation pressure testing program.

Split longitudinally on a horizontal plane, perpendicular to the axis of the outlet, this new "hot tapping" reinforcement eliminates welds in the critical crotch area. Its installation requires a minimum amount of field welding. When used with high yield strength pipe, no welds are required between saddle and line pipe.

The TUBE-TURN Full-Encirclement Saddle is designed for high yield strength thin-wall pipe and for heavy wall cylinders used for headers, bottles and pulsation dampeners. It can be supplied for pipe sizes through 42", any outlet size, in composition and wall thickness to match service conditions.

*The Leading Manufacturer of Welding Fittings and Flanges*

# **TUBE TURNS**

**LOUISVILLE 1,  
KENTUCKY**

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Chicago • Denver • Los Angeles  
San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas



"tt" and  
"TUBE-TURN"  
Reg. U. S.  
Pat. Off.

**HOW INSTALLED**

# How to install the new **TUBE-TURN** Full-Encirclement Saddle for a "Hot Tap"



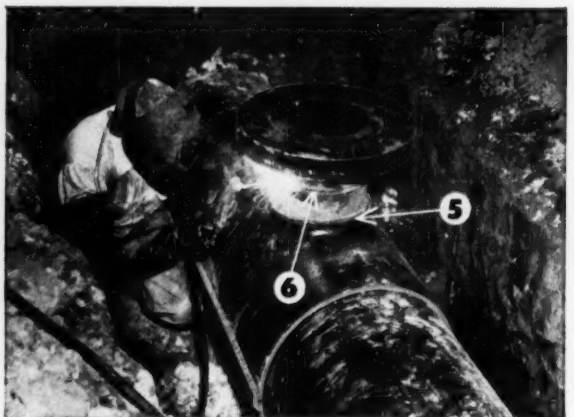
1. Weld branch outlet pipe to run pipe according to normal procedure.  
2. Position and block up bottom half of full-encirclement saddle.



3. Slip top half of full-encirclement saddle over branch outlet. Bring two halves together tightly by means of clamp such as shown.



4. Tack weld longitudinal lap plates to top half of saddle, remove clamp and complete welding of plates. (Plates are shop-welded to bottom half).



5. Fillet weld saddle outlet to branch pipe. 6. Join branch pipe to TUBE-TURN Welding Neck Flange. Normal tapping procedure follows.

**N**OTE THAT when used with high yield strength, thin-wall pipe, as shown above, circumferential welds between saddle ends and run pipe are not required. This precludes possibility of failure due to underbead cracking or to local stress concentrations which exists at such attachment welds with conventional saddles or other types of "hot tap" fittings which must be fillet welded to high yield strength, thin-wall pipe. The TUBE-TURN Full-Encirclement Saddle fully meets all requirements for reinforcement of welded branch connections as developed by Section 8 of the Code for Pressure Piping.

*This new, advanced design  
is another example of  
TUBE-TURNS' pioneering...  
why it pays to do business  
with the leader.*

## **TUBE TURNS**

LOUISVILLE 1,  
KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Chicago • Denver • Los Angeles  
San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas





## ... PACKAGING AND HANDLING EQUIPMENT

**Tray, Reinforced Plastic**

Can be stacked and locked, resistant to most chemicals. (213A)

... Fibrous-glass-reinforced plastic tray is used for freezing, dehydrating, and other food and chemical material-handling operations. Tray has stacking lugs on four sides, permitting stack of trays to be held at 45-deg. angle without

danger of toppling. All sides are open, permitting air passage through trays. The tray is dimensionally stable from -60 to 300 F. It is resistant to most chemicals and alkalis.—Molded Fiber-glas Tray Co., Linesville, Pa.

**Trucks, Electric Fork**

Approved for hazardous areas. (213B)

... Underwriters' Laboratories has approved a line of electric fork lift trucks for use in hazardous locations involving fire or explosion. This was reported as the first such approval given to an industrial truck. Trucks carrying Under-

writers' Type EX label available in 2,000, 3,000 and 4,000-lb. capacity models. Trucks can be used where air contains gasoline, petroleum, naphtha, alcohols, acetone, etc. — Automatic Transportation Co., Chicago 20, Ill.

**Trucks, Fork Lift**

Approved for hazardous areas. (213C)

... Modified electric Carloader fork trucks are approved by Underwriters' Laboratories for operation in hazardous areas classified as Class I, Group D. Such a rating covers atmospheres containing gasoline, petroleum, naphtha, benzene, butane, propane, alcohols,

acetone, lacquer solvents and natural gas. Modifications on the 3,000 to 5,000-lb. capacity trucks range from insertion of sealing boxes at various points in the electrical circuit to use of static-conductive tires.—Clark Equipment Co., Battle Creek, Mich.

**Unloader, Box Car**

Works on dry solids up to 2 in. (213D)

... Savings in space and operator time over conventional rotary or tilting car dumps claimed for S-A box car unloader. Unit designed for installation between 2 adjacent tracks, can work in either direction. Almost all bulk materials up to 2 in. lump size can be

handled readily. Unloading is done by a pantograph arm equipped with scoop. Single operator need take only enough time to redirect arm to different sections of car. Unloading operation requires only 1/4 man hr.—Stephens-Adamson Mfg. Co., Aurora, Ill.

**Unloader, Bulk**

Moves materials from car to storage. (213E)

... Vacu-Veyor vacuum conveyor unloads bulk materials up to 40,000 lb. per hr. It will convey 150 ft. vertically and 200 ft. horizontally. Pickup nozzle maintains a constant strong vacuum, has adjustable air intake to give proper mixture of air and solids.

Even when completely buried it can be operated without choking line. At the discharge, solids are removed from the stream by a cyclone unloader with fine solids recovered by bag type filter. Air discharges through a blower.—Vacu-Blast Co., Inc., Belmont, Calif.

**Unloader, Scoop**

Makes car unloading a safe one-man operation. (213F)

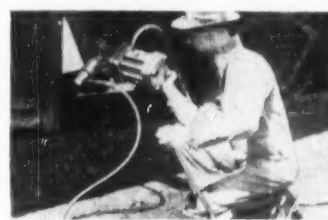
... Automatic power scoop permits one man to unload bulk materials safely and speedily. It is designed for use with box cars unloading into track hoppers, elevators and chutes for belt conveyors. Also it can be used successfully for reclaiming materials from inside storage. Unloader consists of a

power unit mounted alongside the track and connected by a steel cable to the scoop inside the car. Complete control of the unloader is located in the scoop handle so that only one man is needed for its operation. Control is deadman type.—The Jeffrey Mfg. Co., Columbus 16, Ohio.

**Vibrator, Car**

Clamps on hydraulically; speeds handling of sand, coal, cement. (213G)

... Portable air vibrator speeds up unloading of railroad cars. Equipped with hydraulically-operated mounting clamp, type HCRR vibrator can be attached quickly to material handling device. After material has been removed from car, vibrator can be used to keep it moving into or out of hoppers, bins and chutes.—The Cleveland Vibrator Co., Cleveland, Ohio.

**Wagon, Acid**

For safe handling of corrosives. (213H)

... Corrosive materials can be transferred easily and safely by using the completely mobile Acid Buggy. It eliminates waste and prevents damage by spillage. Both interior and exterior of 400-gal. tank are rubber covered. Construction meets ASME code for 40 psi. Equipment includes

Saunders-type rubber lined valves, four 50-ft. lengths of acid hose with nozzles, overflow funnel, gage glass with fittings, pneumatic controls, air filters, air gage, gage board and 75 ft. of air hose. Total weight of tank and wagon is 2,800 lb.—Automotive Rubber Co., Inc., Detroit 28, Mich.

## • Pipe, Fittings and Valves

### Coupling, Spring

Connects tubing or pipe,  
simple and foolproof.  
(214A)

... Spring-clip coupling permits inexperienced man to connect tubing or pipe in a matter of seconds. All that's needed is to press the spring clip, insert the tube and release the spring. Coupling is claimed able to hold high pressures. Teflon O-rings are the sealing members that deform under pres-

sure. Available in a wide range of sizes and in many materials the spring-clip coupling also will be made in the form of tees, elbows, and connectors with threaded ends and hexagon outside for connecting into present equipment.—Master Enterprise Corp. of America, Tulsa, Okla.

### Disk, Rupture

Graphite for corrosive  
systems.  
(214B)

... Rupture disk fabricated of impervious graphite provides maximum resistance to highly-corrosive liquids and gases and to thermal shock. At critical pressure, disk ruptures to re-

lease dangerous built-up pressure. Unit consists of graphite ring and expendable disk. It is available for nozzle sizes from 2 to 12 in.—Falls Industries, Inc., Solon, Ohio.

### Equipment, Fluids Handling

Constructed of hard rubber.  
(214C)

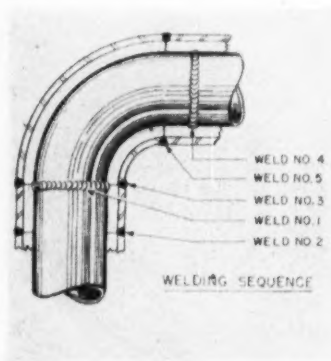
... Line of corrosion-resistant equipment including centrifugal pumps, valves, pipe and fittings is manufactured in both natural and Buna N hard rubber. Pumps are available either with heavy casing and open impeller or lighter construction with closed im-

PELLER. Carbon seal is used in place of conventional packing. This permits complete protective rubber covering of metal shaft. Special compounding allows use of natural hard-rubber up to 180 F.—Vanton Pump & Engineering Corp., New York 1, N. Y.

### Fitting, Jacketed

Welding sequence for  
pipe turns.  
(214D)

... Simple, easy procedure permits use of welding fittings for directional changes in jacketed piping. Jacketed fitting combination consists of long and short radius 90 deg. Tube-Turn elbows, with center line radii closely matching. Advantages: 1.) elimination of need for steam or coolant jumpers; 2.) elimination of flanged joints except where piping must be disassembled; 3.) more accurate temperature control; 4.) minimizes thermal expansion and contraction problems; 5.) provides optimum flow conditions; 6.) permits insulation to be readily and permanently applied. — Tube Turns, Inc., Louisville 1, Ky.



### Fitting, Lubrication

Three built-in check  
valves.  
(214E)

... Lubrication fitting, designed with three checks, guards against loss of lubricant from high pressure plug valves. Two ball checks augment standard valve at fitting top. Two-fold result: 1.) absolute protection

against escape of line fluids, 2.) elimination of simultaneous fouling of all checks (by foreign matter). Fittings serviced by extra heavy booster-type hand gun (model 6268). — Stewart-Warner Corp., Chicago 14, Ill.

### Fitting, Manhole

For pressure.  
(214F)

... Elliptical type manhole fitting withstands 20 to 30% greater working pressure than competitive products.

Unit furnished in two sizes for 600 psi. and 1,000 psi.—Lukens Steel Co., Coatesville, Pa.

### Fittings, Brass

Connect plastic tubing.  
(214G)

... Compression type brass fitting connects polyethylene and other plastic tubing. It installs rapidly, needs only be finger tightened. Joint will hold burst pressure of 0.04 or 0.062 in.

polyethylene tubing. Available in two sizes, fittings are for working pressures up to 125 psi. in  $\frac{1}{4}$  in. O. D. and 100 psi. in  $\frac{3}{8}$  in. O. D.—The Imperial Brass Mfg. Co., Chicago 7, Ill.

### Fittings, Plastic Pipe

Non-slip, do not restrict.  
(214H)

... Barracuda brass fittings offer efficient way to connect flexible plastic piping. Teeth on fitting grip plastic inside and outside the pipe, eliminating previous difficulties in making non-

slip joints. Fittings are designed so they do not cut down flow through the pipe. Fittings come in sizes  $\frac{1}{4}$ ,  $\frac{3}{8}$ , 1, 1 $\frac{1}{2}$ , 2 and 3 in.—Nelson Foundry Co., Morton Grove, Ill.

Acetate Solvents, Crude  
Acetate Solvents, Pure  
Acetic Acid  
Acetic Anhydride  
Acetone  
Acetylene, 15 psi  
Air  
Alcohols  
Aluminum Chloride  
Aluminum Hydroxide  
Aluminum Sulfate  
Aluminum Sulfide  
Alums  
Ammonia Gas  
Ammonia Liquors  
Ammonium Bisulfite (above 7.0 pH)  
Ammonium Carbonate  
Ammonium Chloride  
Ammonium Hydroxide  
Barium Cyanide  
Barium Hydroxide  
Barium Sulfate

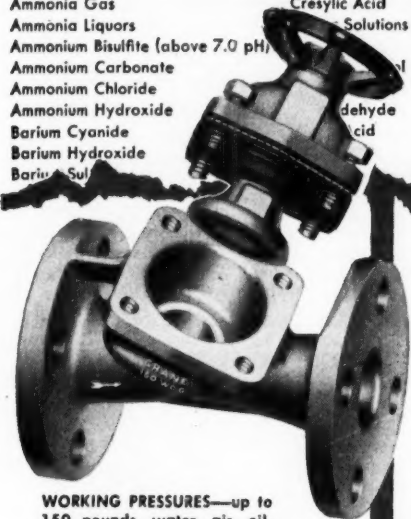
Carbon Dioxide, Dry  
Carbon Dioxide, Wet  
Carbonic Acid, Carbonated Beverages  
Chromic Acid  
Chromium Potassium Sulfate  
Citric Acid  
Coke Oven Gas  
Copper Chloride (Cuprous)  
Copper Chloride (Cupric)  
Copper Sulfate  
Creosote  
Cresylic Acid  
Creosote Solutions

Hydrogen Gas  
Hydrogen Peroxide  
Hydrogen Sulfide  
Iron Chloride (Ferric)  
Iron Chloride (Ferrous)  
Iron Potassium Sulfate (Ferric Alum)  
Iron Sulfate (Ferric)  
Iron Sulfate (Ferrous)  
Iron Sulfide  
Iron Sulfide Lacquer  
Iron Sulfide  
Magnesium Bisulfite  
Magnesium Chloride  
Magnesium Hydroxide  
Magnesium Sulfate  
Magnesium Sulfite  
Mercuric Chloride  
Oxalic Acid  
Oxalic Acid  
Petroleum Oils, Refined  
Phenol (Carbolic Acid)  
Phosphoric Acid  
Phosphoric Acid, Aqueous

Sulfuric Acid  
Sulfurous Acid  
Tartaric Acid  
Tin Chloride (Stannic)  
Tin Chloride (Stannous)  
Titanium Sulfate (Stannic)  
Titanium Sulfate (Stannous)  
Titanium Sulfate  
Water, Acid Mine Waters  
Water, Boiler Feed  
Water, Distilled, Laboratory Grade  
Water, Distilled, Return Condensate  
Water, Fire Protection Equipment  
Water, Fresh, Industrial Supplies  
Water, Saline, Sea Water, etc.  
Zinc Chloride

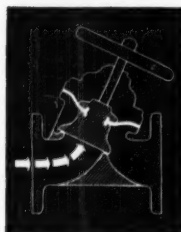
# Name your poison

## or any hard-to-handle fluid



**WORKING PRESSURES**—up to 150 pounds, water, air, oil, or gas, 250°F. maximum temperature, depending on valve size, materials, and service.

### HOW CRANE DIAPHRAGM VALVES WORK



The Crane diaphragm serves one function only—sealing the bonnet. It is not subject to crushing and rapid wear. The seating member is a separate circular flat face disc, firmly attached to the stem and joined to the diaphragm with a special leak-proof connection. This independent seating feature permits positive shut-off with no loss of fluid, even in case of diaphragm failure.

*Better* because they're safer, easier to operate. *Better* because they reduce maintenance to a negligible degree. And that holds true for just about any service, any fluid within rated pressure and temperature.

For Crane now offers the revolutionary diaphragm valve in a new wide choice of body, disc insert and diaphragm materials—in unlined or lined patterns. You specify whatever combination best suits your particular need. The regular line-up includes brass, cast iron, aluminum, or 18-8 SMO body and disc . . . with diaphragm and disc insert of Neoprene, Buna N, Kel-F, or natural rubber. Regular linings are Neoprene or hard natural rubber. Also sliding stem valves for automatic operators of all types. In addition, Crane Diaphragm Valves are regularly available for high-vacuum service, or oxygen and acetylene usage. Other body and disc materials, as well as linings, available on special order. Sizes from 1/2 to 6-inch.

### NEW LITERATURE . . . NEW FILM

Get complete, interesting facts about the expanded line of Crane Packless Diaphragm Valves in a new 24-page folder . . . and a new sound movie. You'll see how this revolutionary valve solves flow control problems where others fail. Check with your local Crane Representative, or use the coupon below.

# CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Ill.  
Branches and Wholesalers Serving All Industrial Areas

**VALVES • FITTINGS • PIPE • PLUMBING • HEATING**

CRANE CO., 836 S. Michigan Ave., Chicago 5, Illinois

Gentlemen:

I would like to arrange for a free showing of the Crane Diaphragm Valve Film ( ).

I would like a copy of Diaphragm Valve Folder ( ).

Name.....

Company.....

Address.....

City..... Zone..... State.....

**PIPE, FITTINGS AND VALVES . . .****Fittings, Tube**

Leak-proof, reassemble without leaking. (216A)

... Ermeto patented tube fittings provide more positive seal than flared or compression type fittings. Require no flaring, threading, welding, or soldering. Tubing needs no special preparation or tools to complete installation. Tube fitting consists of sleeve, nut and tapered body. Because of leak-

proof features, fitting specified for use on production line, in tool maintenance, wherever metal tubing is used for transferring liquids or gases. Ermeto fittings available in carbon and stainless steels from stock, and in monel and brass on special order. — *The Weatherhead Co., Cleveland 8, Ohio.*

**Fittings, Tube and Pipe**

Shock absorbing, withstand high pressures. (216B)

... Shock-absorbing and vibration-fatigue-proof fitting for metal tubing and piping eliminates metal-to-metal contact. Originally for aircraft use, Sealastic fitting now adapted to general industrial use. Fittings withstand

pressures up to 4,000 psi. after finger tightening. After wrench tightening, they sustain pressure resistance beyond that of tube itself. Temperature range, -70 to +400 F.—*Chicago Forging & Mfg. Co., Chicago 14, Ill.*

**Flange, Reducing**

Permits closer makeup, low cost. (216C)

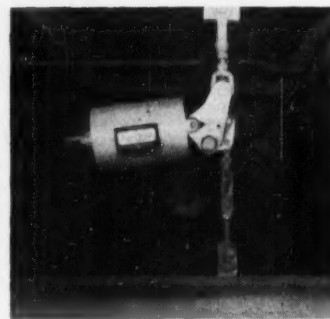
... Stainless steel lined, cast iron reducing flange is designed to permit much closer makeup than formerly was possible. Flanges make up to as little as 1 in. in most sizes. Unique design

makes for relatively low cost. Various types of stainless steel can be used for lining to suit particular process requirements.—*Grand Machine & Tool Co., Rahway, N. J.*

**Hanger, Pipe**

Gives constant support for loads 200 to 16,000 lb. (216D)

... Navco counterpoise pipe hanger gives accurate, efficient support for high-temperature piping systems. As pipe expands or contracts, due to temperature changes, hanger gives constant load-supporting effort throughout entire range of travel. All principal load-carrying parts are concentrated at one end of the hanger. Overhanging spring assembly can be revolved at any angle about load and support rods. Hangers available in 16 frame sizes. Load capacities range from 200 to 16,000 lb.—*National Valve & Mfg. Co., Pittsburgh 1, Pa.*

**Hose, Glass Fiber**

Withstands heavy loads. (216E)

... Glass fiber fire hose stands up under jolts from passage of heavy trucks. Compared to conventional cotton hose, glass fiber hose is 20 lb. lighter per 100 ft. length. Hose car-

cass does not absorb water, stays lighter and more flexible on fire line. Thinner wall construction and larger bore allow greater flow.—*Boston Woven Hose & Rubber Co., Boston 3, Mass.*

**Hose, High Pressure**

Handles liquid ammonia, minimum burst pressure of 1,750 psi. (216F)

... Liquid or gaseous ammonia is readily handled in high pressure hose containing special resistant rubber compound. Ammonia must be kept under pressure to retain its liquid state.

Hose is designed for minimum burst pressure of 1,750 psi.; serves for transfer between storage, truck etc. — *B. F. Goodrich Co., Industrial Products Div., Akron, Ohio.*

**Hose, Wire Reinforced**

Handles liquefied petroleum gases. (216G)

... Ironsides butane-propane hose combines layers of horizontally braided steel wire and rayon cord reinforcement. Minimum bursting strength is 1,750 psi. with actual burst pressures exceeding 2,300 psi. Hose features non-porous and oil-resistant rubber tube. It's available in sizes from ½ to

2 in.; is made on a mandrel to insure uniform inside diameters for quick, positive coupling. Each length has two separate static wires interlaced with the reinforcing braids to bleed off electric charges.—*Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Pittsburgh 22, Pa.*

**Hose and Pipe, Plastic**

Incorporate Teflon for chemical inertness. (216H)

... Both flexible Fluoroflex hose and rigid pipe incorporate outstanding chemical inertness of Teflon. Fluoroflex-T flexible hose consists of a seamless extruded tube of plastic material reinforced with a braided jacket of stainless steel wire. It's good over a temperature range from -110 to

+450 F. Rigid pipe consists of internal sleeve of Fluoroflex-T bonded to an external jacket of Teflon-coated glass fabric. An additional external sleeve of Fluoroflex-T also can be used. Hose made in nine sizes from ½ to 1½ in.; pipe offered in sizes from 1 to 4 in.—*Resistoflex Corp., Belleville, N. J.*



Another leading manufacturer places  
its confidence in

# DURCO

corrosion resisting equipment

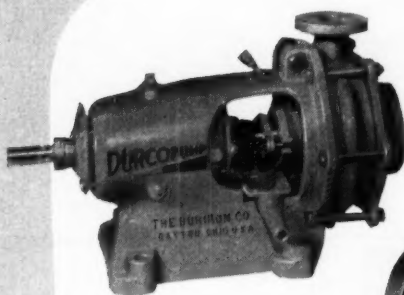
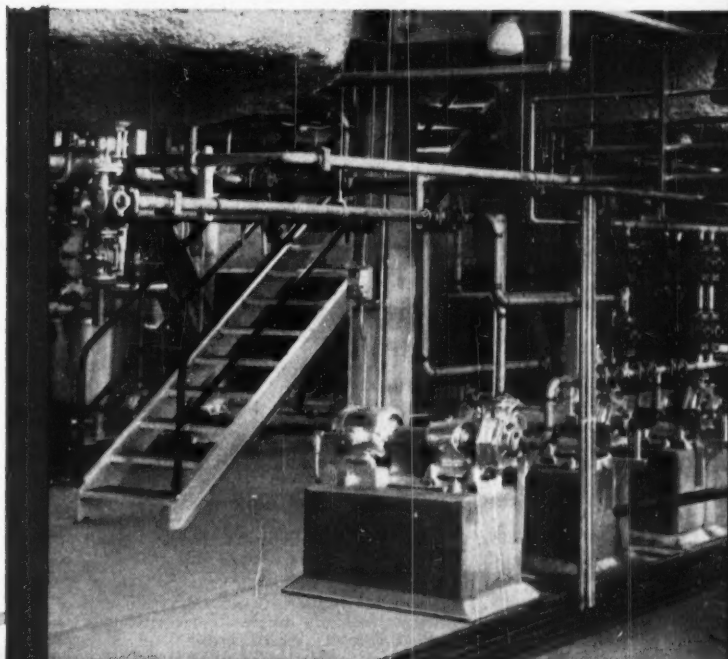
## Kodak

TRADE-MARK

In their new Elon facilities at Kodak Park, Eastman Kodak Co. uses Durco corrosion resisting pumps and valves to handle crude Elon, a developing agent, in the various stages of purification.

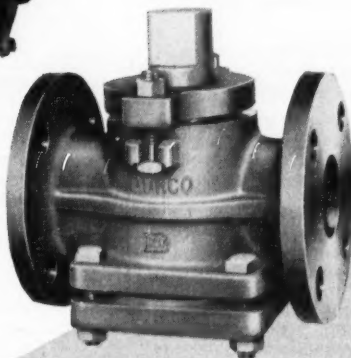
Series R Durcopumps and Durco Type F valves (both shown) can be depended upon for long, trouble-free service. These heavy duty chemical pumps are available in 12 standard Durco alloys to provide the best possible service in various corrosive conditions. The Durco Type F valve is an easily operated, non-lubricated, maintenance-free plug valve. Built of Durco corrosion resisting alloys, with a Teflon®\* sleeve, it has proved outstanding in hundreds of applications.

\*Registered trademark of E. I. du Pont de Nemours & Co. Inc., for its tetrafluoroethylene resin.



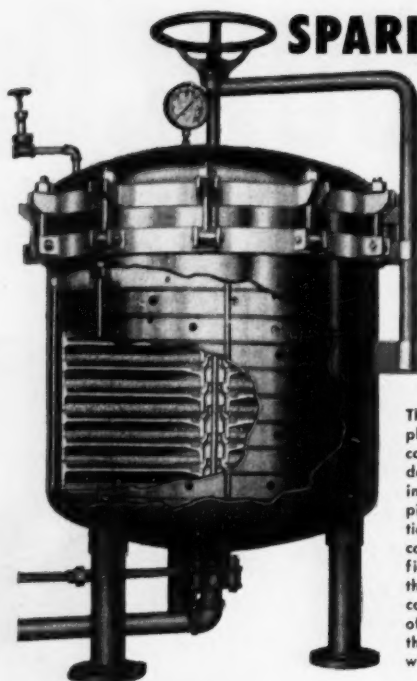
DURCO TYPE F VALVE

SERIES R STANDARD  
DURCOPUMP



*For complete details on these  
Durco products write for free  
Durcopump Bulletin P/1 and  
Durco Valve Bulletin V/4.*

THE DURIRON COMPANY, INC., DAYTON, OHIO

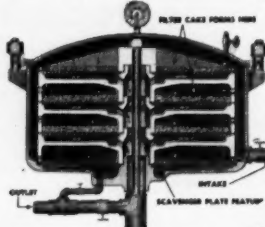


# SPARKLER HORIZONTAL PLATE FILTERS

for fine filtering and polishing of liquids

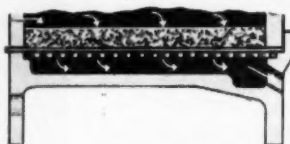
The standard horizontal plate filter . . . with positive cake stability and other operating features unmatched by any other filter.

The Sparkler horizontal plate provides positive cake stability with no danger of cake cracking, slipping, or dropping even with a variation in pressure or a complete shut down of filtering. No break through is possible. Pre-coating is uniform and of even thickness. A very thin pre-coat is practical when desired.



Cross section of horizontal plate filter showing cake resting on plates without tensile strain. No danger of slipping, cracking, or passing of filter aid. Filter aid is floated into position for an even pre-coat and built-up cake.

The three parts of a horizontal plate assembly can be easily taken apart for thorough cleaning, making possible complete sanitation in filtering food products.



Free drainage is a feature of horizontal plate construction. Flow friction is greatly reduced to promote high flow rates.

## FOR FILTERING CHEMICALS

Sparkler Filters are available in a wide range of sizes and constructed of a variety of metals to meet practically every requirement in the Chemical and Pharmaceutical industry. Tanks and wettable parts can be supplied in stainless steel, mild steel, bronze, nickel, Monel, Hastelloy or plastic; steam or brine jacketed in capacities up to 10,000 G.P.H. Filter plates are available in two depths, deep plates for liquids carrying a large percentage of solids; shallow plates for liquids carrying a small percentage of solids, the latter providing a larger filtering area in the same size tank.

Sparkler Filters are particularly suited for fine filtration and polishing operations. They are equally efficient for continuous or intermittent operation. Complete recovery of product is obtained by "wash through" or "blowdown" of cake without removal from filter. The Sparkler patented scavenger plate acts as an auxiliary filter with independent control valve, filtering each batch down to almost the "last drop" leaving practically no unfiltered hold over in the bottom of the tank.

Any kind of filter media, screens, or cloths, and all grades of filter paper, together with all types of filter aid such as diatomaceous earth, activated carbon, fullers earth, etc., can be used in a Sparkler filter with maximum efficiency. Filter aids are built up in an even cake and a very thin pre-coat is possible with attendant economies in time and material on a Sparkler horizontal plate.

Perhaps more Sparkler Horizontal Plate Filters are used today in chemical and pharmaceutical processing than any other single type of filter.

**FOOD PROCESSING FILTERS** — The positive sanitation feature of horizontal plates and tanks is one important reason why Sparkler filters are popular in food processing plants.

**LARD AND VEGETABLE OILS** are handled to good advantage in Sparkler Filters and a better finished product produced because the first run through the filter is not contaminated by rancid oils and soap particles retained in laundered filter cloths as used in some other methods of filtering.

**BEST SUGAR SYRUP** — 65° Brix juice is filtered to a highest purity and brilliant clarity in Sparkler Filters. On horizontal plates the filter cake is built up evenly with uniform density and thickness and the cake can be thoroughly washed with a minimum of wash water. Sudden interruptions of house flow or changes in Brix have no effect on cake stability; the cake will not pass filter aid due to cracking or dropping because cake is held in position by gravity and is not dependent on sustained pressure for stability.

## INFORMATION YOU SHOULD FURNISH OUR ENGINEERS

**Nature of fluid**—Inert, volatile, inflammable? Give pH, if available.

**Physical conditions**—Temperature at filtering point? Viscosity at filtering temperature, in SSU or equivalent, or give SAE rating.

**Flow and pressure**—Is filter to be stationary or portable? Batch-wise or continuous flow? For installation in pressure line or to be equipped with pump? Desired flow rate in gallons per hour or per minute. If in-line installation, give maximum flow rate, maximum allowable working pressure and minimum.

**Nature of solids**—Hard, abrasive, sticky, fibrous, flocculent, colloidal? Percentage of solids?

**Operating conditions**—Length of cycle (time between cleanings) desired? If filter is to have pump and motor, should motor be standard, splash-proof, or explosion proof? Give voltage, phase, cycle of current available for motor.

You are invited to place your filtering problem in the hands of our filtration engineers. They have developed many successful methods of filtering difficult materials and may be able to prescribe a solution to your problem without wasteful experimentation.

## Specifications . . . Horizontal Plate Filters

Model No.	Capacity GPH	Area Sq. Ft.	Cake Sp. Cu. Ft.	DIMENSIONS			Ship. Wt. Lbs. (Approx.)
				Height	Width	Length	
8-3	30-60	1.0	.073	16"	10"	24"	120-150
8-6	100	2.0	.15	17"	15"	27"	125-140
14-D-4	200	3.2	.48	40"	Circle 29" in diameter		275-400
14-S-7	400	5.6	.38	40"			325-450
18-D-4	400	6.2	.9	45"			585-735
18-S-7	550	10.8	.67	45"			595-745
18-D-6	500	9.2	1.35	49"			625-775
18-S-11	750	17.0	1.16	49"			625-825
18-D-8	650	12.3	1.8	53"			665-865
18-S-15	1200	23.0	1.44	53"			685-885
18-D-12	1000	18.5	2.7	61"			745-945
18-S-23	1800	35.4	2.17	61"			775-975
33-D-7	2000	37.8	6.3	69"	44" x 66"		1505-2205
33-S-11	3000	60.0	4.9	69"	44" x 66"		1500-2200
33-D-9	2600	48.6	8.0	74"	44" x 66"		1635-2335
33-S-14	3600	75.5	6.3	74"	44" x 66"		1650-2350
33-D-12	3500	64.8	10.8	81"	44" x 66"		1835-2535
33-S-19	6000	100.0	8.5	81"	44" x 66"		1900-2600
33-D-17	5000	91.8	15.3	96"	44" x 66"		2155-2855
33-S-28	8500	151.2	12.6	96"	44" x 66"		2350-3050

Rubber-lined tank, molded composition plates and rubber-lined piping available in certain 18 and 33 inch sizes. Specifications on request. No scavenger plate in rubber-lined construction.

All standard models available in carbon steel, stainless steel, pure nickel or monel, bronze, Hastelloy, and Inconel.

**SPARKLER MANUFACTURING CO. • MUNDELEIN, ILL.**

# SPARKLER VERTICAL PLATE FILTERS

**Heavy Duty Large Capacity**

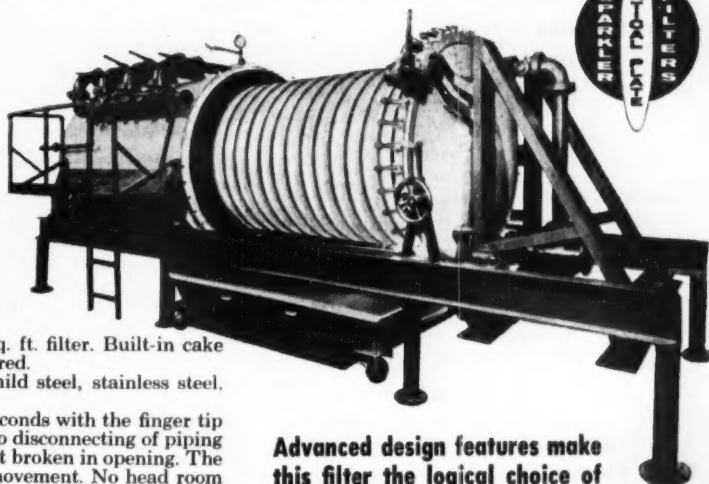
## MODEL MCR Retractable Tank Filter

This filter will accommodate products which have a heavy residue. Plates can be spaced at any distance apart to allow for a cake thickness up to 3" or more. Cake can be reduced to a semi-dry condition with blow down and removed by hand scraping or in some cases merely tapping the edge of the plate. This solves the sewer disposal problem with a heavy cake which frequently amounts to a ton in a 1000 sq. ft. filter. Built-in cake flush off spray tubes can be furnished when desired.

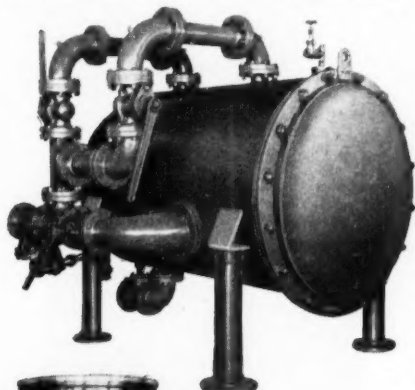
The filter wetting parts can be supplied in mild steel, stainless steel, Hastelloy or other metals.

One man can open this filter in a matter of seconds with the finger tip automatic control power opening mechanism. No disconnecting of piping is necessary, and the filter seal of the plates is not broken in opening. The self-sealing cover is released by a single lever movement. No head room is required above filter to open and clean.

Heavy products such as Tall Oil, and like oils, primary beer filtration, etc., are filtered very successfully in the MCR retractable tank filter.



**Advanced design features make this filter the logical choice of those who want the best.**



## MODEL SCJ Heavy Duty Water Filter

Available in capacities up to 5,000,000 gallons per 24 hr. operation.

The Sparkler SCJ filter introduces a new phase in large volume filtration of water. Now it is possible to employ the high quality, fine filtration characteristics of a diatomite filter for large volume plant water supply, municipal water works, and swimming pools. Clean pure water can be obtained in any required volume from sources such as lakes, rivers, and wells. The SCJ diatomite filter will remove all suspended matter either colloidal or solid, such as silica sand, algae, organic material, silt, etc. Bacteria is reduced 80% to 100% depending on the type of bacteria and the grade of diatomite used as a filter aid. Thus reducing the required chlorination.

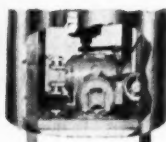
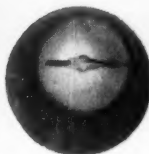
Single units capable of handling 5,000,000 gallons of water per day are available. Multiple units can be engineered into a system for larger requirements.

Less than 0.2% of water is required to backwash and clean the largest filter units, a complete fresh pre-coat applied and the filter ready to resume service in 15 minutes.

Operation is simple, no highly skilled specialized personnel is required to insure efficient performance.

Many SCJ filter installations are now operating in industrial plants and in municipal water supply systems with complete satisfaction.

## Sparkler New Type Combination Unit Slurry Feeder for Diatomite and other Filter Aids



The important feature of this new Sparkler combination unit slurry feeder is the slow speed agitator operating at the bottom of the tank, that has the advantage of not breaking down the natural cellular structure of diatomite thus preserving the full porosity of the diatomite cake. A much better high flow filter cake is built up with slurry from this feeder.

The top of the tank is fitted with a removable cover to keep slurry clean and sanitary. One motor enclosed with automatic feeder in the base of the unit operates both feeder and agitator.

Tanks and agitator can be supplied in mild steel, stainless steel, or other metals to meet requirements.

All sizes and types of slurry tanks, surge and supply tanks, with or without feeders, can be furnished in any metal as separate equipment.

### Model MCR Filter Capacities

Model No.	Flow Rate	Area Sq. Ft.	Cake Sp. Cu. Ft.	Plate Spacings	DIMENSIONS		
					Height	Width	Length
MCR-28-14	1 G.P.M. per Sq. Ft. Based on Water Viscosity	100	8.5	3"	57"	45"	134"
MCR-34-13		150	12.5	3"	66"	64"	159"
MCR-34-18		200	17.0	3"	66"	64"	189"
MCR-46-11		250	20.8	3"	94"	68"	195"
MCR-46-13		300	25.0	3"	94"	68"	216"
MCR-46-15		350	29.5	3"	94"	68"	230"
MCR-46-17		400	34.0	3"	94"	68"	251"
MCR-46-22		500	41.6	3"	94"	68"	279"
MCR-64-18	1 G.P.M. per Sq. Ft. Based on Water Viscosity	750	62.4	3"	132"	108"	280"
MCR-64-25		1000	83.2	3"	132"	108"	312"

### Model SCJ Filter Capacities

Model No.	Filter Area Sq. Ft.	Pipe Conn. Inches	Approx. Floor Area (Feet)	GALLONS PER DAY*	
				1 GPM/Ft.²	2 GPM/Ft.²
Model SCJ 24-3	25	3	5x2	36,000	72,000
Model SCJ 24-9	50	3 or 4	5x3	72,000	144,000
Model SCJ 24-13	75	3 or 4	5½x3	108,000	216,000
Model SCJ 33-9	100	4 or 6	6½x3	144,000	288,000
Model SCJ 33-13	150	6	7½x5	216,000	432,000
Model SCJ 33-18	200	6	8½x5	288,000	576,000
Model SCJ 40-16	250	6 or 8	8½x6	360,000	720,000
Model SCJ 40-19	300	6 or 8	9x6	432,000	864,000
Model SCJ 40-22	350	6 or 8	9x6	504,000	1,008,000
Model SCJ 40-25	400	6 or 8	9x6	576,000	1,152,000

Larger capacities up to 2000 sq. ft. can be engineered. (\*) Lower or higher flow rates (GPM/Ft.²) may be used when advantageous to the problem involved.

**Service Representatives in Principal Cities • Plants at Galt, Ontario, Canada • Amsterdam, Holland**



## PIPE, FITTINGS AND VALVES . . .

**Joint, Rotating Steam**

Has longer life, costs less, packless, needs no lubrication. (220A)

. . . Series 2000 type S self-supporting rotating steam joint has lighter weight, smaller size, lower cost and longer life than original joint. Design works well where suitable supports cannot be provided and where lateral movement ex-

ists. It's used for admitting steam or other fluids into rotating rolls and cylinders of machines in the paper, textile and rubber industries. Joint is self-adjusting. — *The Johnson Corp., Three Rivers, Mich.*

**Manifold, Three Valve**

Saves space. (220B)

. . . Two shut-off valves and one bypass valve in Demi-34 make compact, rugged and tamper-proof valve mani-

fold. Compared to three separate valves and fittings, it reduces connections.—*G. W. Dahl Co., Bristol, R. I.*

**Nozzle, Nylon**

Withstands abrasion, chemical attack. (220C)

. . . Nylon nozzles on pulp cleaning device show good performance record for withstanding abrasion and chemical attack. Low rate of wear in presence of caustic, complex wood acids, dilute sulfuric acid. Nozzle location

keeps it constantly immersed in pulp and paper stock where it is subject to abrasive and corrosive wear. Nozzles are machined from 1-in. dia. rod. — *The Polymer Corp. of Pennsylvania, Reading, Pa.*

**Pipe, Clay**

Has screw seal, adaptable for downspouts. (220D)

. . . Screw Seal (clay pipe with plastic threaded couplings) good for downspouts handling roof run-off from chemical plant buildings. Downspout corrosion eliminated. Pipe is combina-

tion of vitrified clay pipe with threaded ends of polyvinyl chloride Plastisol. Comes in 3 ft. lengths with either 4, 6 or 8 in. diameter.—*The Robinson Clay Products Co., Akron 9, Ohio.*

**Pipe, Flexible Plastic**

Footage marked throughout coil. (220E)

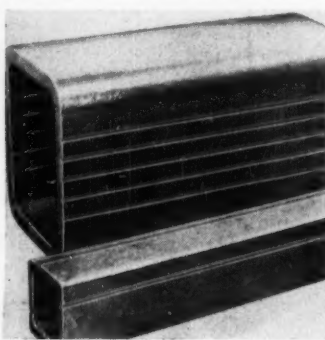
. . . Flexible polyethylene pipe, from  $\frac{1}{2}$  to 6 in., comes measure marked at 10 ft. intervals throughout coil. Inventories taken by visual observation. Speedy installations. Measurement

quickly calculated to fraction of inch with ordinary pocket rule. Recommended for corrosive liquid process lines.—*The Plastex Pipe and Extrusion Co., Columbus, Ohio.*

**Pipe, Floor Drain**

Vitrified clay, sized on job. (220F)

. . . Channel pipe, designed especially for sloping drains and gutters in chemical plants, is made of vitrified clay. It can be tailored on the job to fit drain depths from 4 to 12 in. As delivered Chemi-Drain looks like rectangular sewer pipe. Each side of the pipe has five grooves. Pipe is separated into the desired channel section by a sharp blow in the proper groove. Curved tile covers the upper edges of the channel pipe making the installation flush with the floor. Drain then can be covered with either a metal grill or a solid floor plate.—*The Logan Clay Products Co., Logan, Ohio.*

**Pipe, Graphite**

Withstands high temperature. (220G)

. . . Graphite pipe now is being fabricated to withstand temperatures up to 750 F. Resin-free dense form of graphite in pipe permits operation at this high temperature level. Graph-I-Tite pipe and fittings up to 4 in. I. D.

are available. Material also is used in shell and tube heat exchangers up to 100 sq. ft. transfer area. Tube, tube sheets and channel are Graph-I-Tite while steel is used for the shell.—*Falls Industries, Inc., Solon, Ohio.*

**Pipe, Rigid Plastic**

Polyvinyl chloride, full range of sizes, fittings. (220H)

. . . Line of rigid plastic piping and tubing in wide range of sizes with full range of fittings is fabricated of unplasticized polyvinyl chloride. Pipe has high resistance to most inorganic and organic materials. Ultimate tensile strength is 7,000 psi.; compressive

strength is 12,000 psi.; flexural strength is 13,000 psi. Heat distortion occurs only above 165 F. Pipe stocked in 10- and 20-ft. lengths in standard and extra heavy weight. Sizes and fittings range from  $\frac{1}{2}$  to 2 in.—*Alpha Plastics, Inc., West Orange, N. J.*

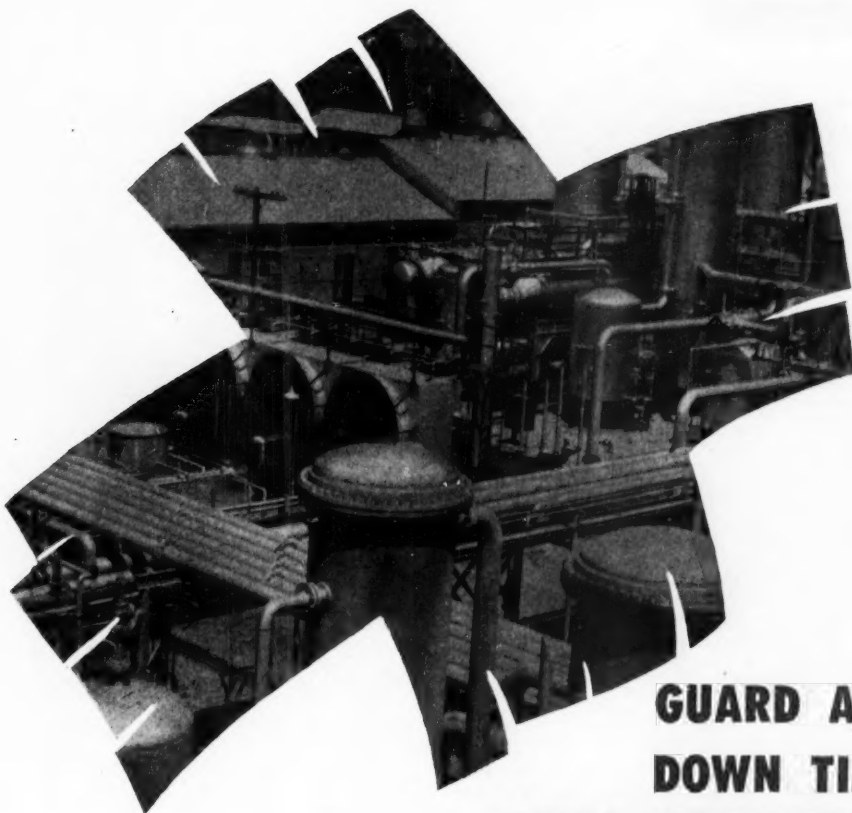
**Pipe, Rigid Vinyl**

0.5 to 4 in.; corrosives to 190 F. and 500 psi. (220I)

. . . Kraloy D-500 rigid vinyl-plastic pipe handles corrosive chemicals up to 190 F. and 500 psi. Other advantages; tensile strength of 10,000 psi., resistant to heat, sunlight, weather, ultraviolet rays. Material does not become

brittle, is nontoxic. Pipe is available in  $\frac{1}{2}$  to 4 in. sizes with all necessary molded fittings consisting of ells, tees, reducers, nipples, tapered sleeve couplings and threaded adapters.—*Kraloy Plastic Pipe Co., Los Angeles 22, Calif.*





## GUARD AGAINST DOWN TIME

### WHEN PRESSURES ARE UP With Watson-Stillman Forged Steel Fittings . . .

The high cost of down time in today's high pressure processing and power plants demands careful selection of piping materials. This goes *double* for the fittings.

**WATSON-STILLMAN FORGED STEEL FITTINGS** give you maximum protection against high pressure, heat, corrosion, shock and vibration —elements often responsible for piping failures.

All W-S Carbon Steel Fittings are drop forged to produce the well-known forged-fiber structure with exceptionally high tensile and impact strength. They're designed for high strength, too, with extra heavy walls where you need them. And they're precision machined for perfect alignment.

Watson-Stillman Fittings are also available in forged stainless and alloy steels for exceptional service at high and low temperatures and for maximum resistance to corrosion.

For strong, tough, trouble-free joints—for safe, dependable operation of your piping system—specify W-S Forged Steel Fittings. Available in sizes  $\frac{1}{2}$ " to 4" in both SCREW-END and SOCKET-WELDING types. Write for information today.

*Sold Through Leading Distributors*

## WATSON-STILLMAN FITTINGS DIVISION

### H. K. PORTER COMPANY, INC.

Roselle, New Jersey



**PIPE, FITTINGS AND VALVES . . .****Pipes and Fittings, Jacketed**

Weld ends. (222A)

. . . Jacketed pipe and fittings with weld ends have been added to standard

line of steam jacketed pipe and fittings. —Red Jacket Co., Pittsburgh 22, Pa.

**Reducer, Plastic Pipe**

Side outlet one pipe-size smaller than run.

(222B)

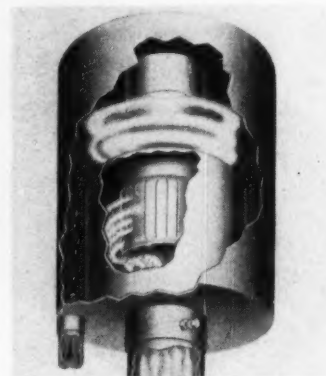
. . . Plastic pipe reducer insert tee fitting has side outlet one pipe-size smaller than the run. Fitting available in run size up to 2 in. Reducer tee facilitates installation of stepdown lat-

erals for water lines, sprinkler systems, etc. It's quickly and easily joined in same manner as used for standard insert couplings.—Carlson Products Corp., Cleveland 5, Ohio.

**Trap, Exhaust Vapor**

Removes entrained particles, no moving parts. (222C)

. . . Exhaust head for industrial stacks removes entrained nuisance particles from vapor discharging to atmosphere. Troublesome oil, water, dirt and process liquor particles thus are kept off nearby equipment and buildings. The head has no moving parts or filters. Guaranteed 99% effective, the unit has a fabricated steel body and stainless steel centrifugal element. Manufacturer claims greater operating efficiency with increased velocity through the units. Standard models have slip-on flange connection for the stack and threaded connection for the drain.—V. D. Anderson Co., Cleveland 2, Ohio.

**Trap, Float**

Vents liquid from piping. (222D)

. . . Corrosive liquids collecting in air, gas or steam systems can be drained off automatically through float trap. Draining takes place continuously without permitting escape of system air

or gas. Trap mechanism consists of valve and seat, lever and ball float inside case; all float components are made of stainless steel.—V. D. Anderson Co., Cleveland 3, Ohio.

**Tubing, Fin**

Made with integral internal fins. (222E)

. . . Tubing now is being extruded with integral fins on the internal surface. While first produced of a special heat-resisting stainless steel it now can be fabricated also from a number of steels within a limited size range. Tubing is being used in a heat ex-

changer with fire on the outside and gas on the inside. Availability is outgrowth of new extruding technique for special steels that has passed out of experimental stage.—Tubular Products Div., The Babcock & Wilcox Co., Beaver Falls, Pa.

**Tubing, Large Diameter**

Unplasticized, unmodified, polyvinyl chloride. (222F)

. . . Rigid polyvinyl chloride Vyflex tubing and ducting now is manufactured with 6, 8, 10, and 14 in. I. D. in lengths of 4 ft. Several efficient joining methods are in use for making multiple pipe-length installations. Material is ideal where large diameter sec-

tions are needed for corrosive conditions, such as found in waste systems, exhaust ducts and feeder lines. The chemical composition of the tubing is identical with that of Vyflex rigid polyvinyl chloride pipes and sheets.—Kaykor Industries, Inc., Yardville, N. J.

**Tubing, Stainless Steel**

High strength, non-porous, seamless. (222G)

. . . New fabricating methods produce high-tensile-strength stainless steel in a variety of configurations. Although light in weight, tubing can withstand high pressure and extreme heat. A work hardening process increases the yield and tensile strength. Ordinary 3-in. O. D. tubing would need a wall

thickness of 0.025 in. for a working pressure of 500 psi. The new high strength tubing can hold the same pressure with a wall thickness of only 0.015 in. This means a savings of 40% on weight and material and good looks of seamless construction. — Flexonics Corp., Maywood, Ill.

**Valve**

Replaces troublesome gate or diaphragm valves. (222H)

. . . Cushioned Flowtrol valve moves easily from fully-opened to tightly-closed position through pilot-cock control of line pressure. Valve piston designed with about twice the area above the piston as below it. Thus with line pressure above piston as well as under it, valve must close. Flowtrol valves

used on water, oil, air and many liquids at pressures ranging from 15 to 400 psi. Valve can be equipped with special two-piece piston to prevent return flow of liquid. Thus it acts as a check valve when inlet pressure drops. — Golden-Anderson Valve Specialty Co., Pittsburgh 22, Pa.



*"You see POWELL VALVES everywhere!"*

Not surprising when you realize that Powell makes more kinds of valves and has probably solved more valve problems than any other organization in the world. And this has been going on since 1846.

Wherever flow requires dependable control,

there's the place for Powell Valves—available through distributors in principal cities. Made  $\frac{1}{8}$ " to 30" and 125 pounds to 2500 pounds W. S. P. Bronze, iron, steel and corrosion resistant alloys. On problems, write direct to The Wm. Powell Company, Cincinnati 22, Ohio.

**CONTROLS FOR THE LIFE LINES OF INDUSTRY**



# Powell Valves

*108th  
year*

**PIPE, FITTINGS AND VALVES . . .**

**Valve, Automatic Control**

For 5,000 to 50,000 psi.,  
— 100 to + 450 F.  
(224A)

. . . Automatic and manual operations have been combined in one control valve. Result: convenient and positive supplementary control during start-up periods or when system is shut down temporarily for instrument repair. Models 1520 SMW and 1560 SMW furnished

with standard Domotor for automatic control and side-mounted handwheel for manual control. Units withstand operating pressures up to 5,000 psi. with special applications to 50,000 psi.—*The Amin Co., Los Angeles 23, Calif.*

**Valve, Automatic Shutoff**

Like sprinkler. (224B)

. . . Automatic shutoff safety valve acts like standard sprinkler head. Used

on gas and liquid lines carrying fuel.—*Valco Inc., Cincinnati 15, Ohio.*

**Valve, Bleeder**

Positive closure, for hydraulic and pneumatic lines.  
(224C)

. . . Semi-automatic bleeder valve operates equally well on both hydraulic and pneumatic lines of any size or pressure. Valve is spring-loaded rotary type. It uses channeled knife-edged cap to uncover the bleed port with a twist of external head. Internal spring

snaps valve closed when the head is released. Knife edge of bleed-port cap shears off and cleans out any entrainment caught at bleed opening. Positive closure and seal are assured every time valve is used.—*Greer Hydraulics, Inc., Brooklyn 15, N. Y.*

**Valve, Blind**

Fits large pipelines, long life, little maintenance.  
(224D)

. . . Blind valve fulfills growing industrial demands for such a unit to accommodate larger pipe lines. Valve is 5-bolt, 18-in. unit with ASA rating of 150 lb. for pressures up to 230 lb. It provides full diameter, smooth round opening or permanent leakproof shut-

off. Service life is practically unlimited and maintenance negligible. Valves regularly constructed of carbon steel, but can be made of other materials for special requirements. Standard packing is Hycar synthetic rubber.—*Hamer Oil Tool Co., Long Beach 6, Calif.*

**Valve, Butterfly**

Has resilient seat, operating pressures to 150 psi.  
(224E)

. . . Aimed at simple, foolproof operation on low pressure service, butterfly valve will hold pressure or vacuum and shut off completely against suspended solids. Key to valve's versatility: resilient neoprene seat. Seal ring exerts positive pressure against butterfly disk when valve is closed. It's not subject to scoring by abrasive particles. If a bit of solid is caught, resilient seat can deform around it, still maintaining tight seal. Each size valve has full hole opening and is self-cleaning. Operating pressures to 150 psi. Sizes: 2 to 12 in.—*Keystone Tool Corp., Houston 5, Texas.*



**Valve, Check**

Light weight, eliminates leakage.  
(224F)

. . . Weighing 50% less than best standard check valve, Streamflo synthetic seal check valve gives full pipe opening. Outstanding features: O-ring seal bonnet secured by snap ring instead of a heavy flange. There's no pin through the body for clapper linkage;

this eliminates possible leakage. Removing bonnet automatically releases clapper for quick inspection. Valves available in cast iron for pressures to 300 psi. and in steel for pressures from 300 to 1,200 psi.—*Frank Wheatley Pump & Valve Co., Tulsa, Okla.*

**Valve, Check**

Feathers when open, seatless, absolute closure.  
(224G)

. . . Semi-flexible feathering type disk is featured in check valve for air and gas lines. Pressure drop is negligible. Inner part of valve consists of rubber (or other pliable material) bonded to center post, backed up by 2 elliptical reinforcing plates. When open, valve-

leaves assume streamlined feathered position; when closed, opposing reverse flow, pliable elliptical sections completely close the bore of valve chamber. Valve closure is absolute. Standard unit is designed for 50 psi. and 200 F.—*Techno Co., Erie, Pa.*

**Valve, Control**

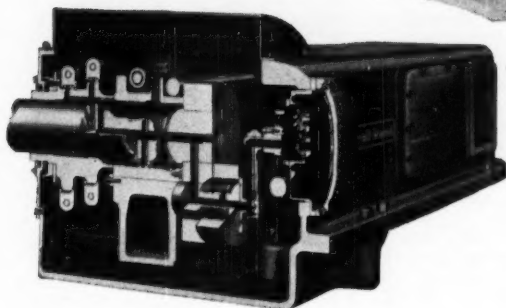
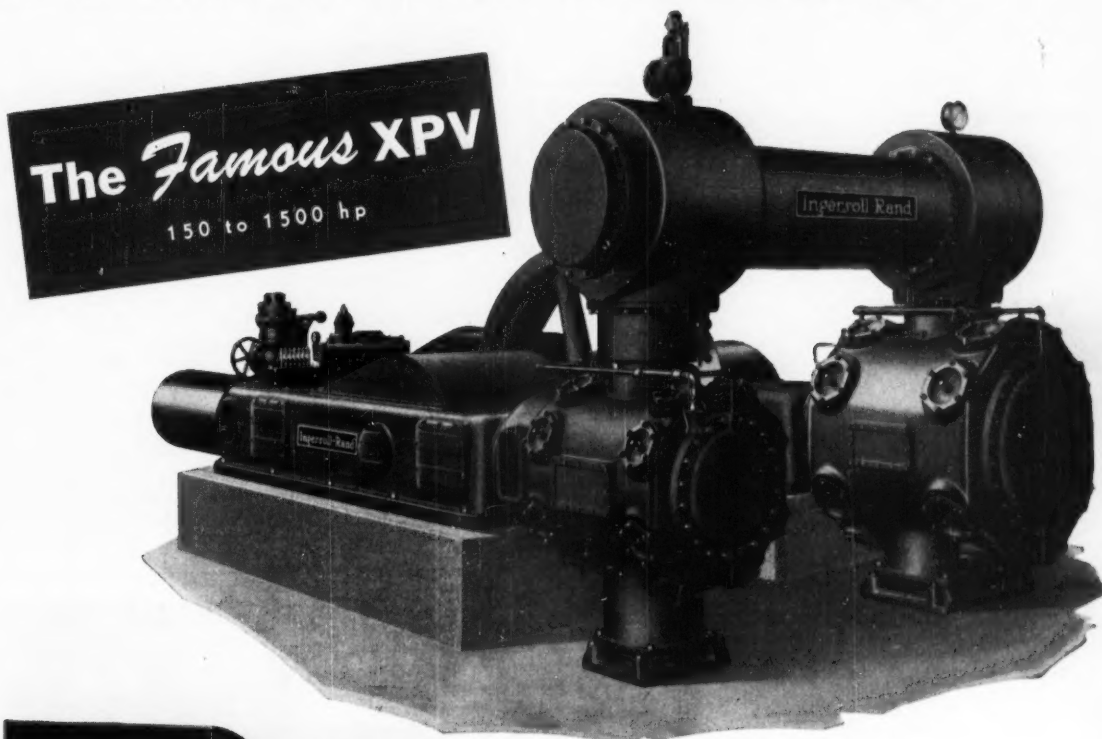
Handles low flow at high pressures. (224H)

. . . Wee Willie Domotor control valve makes possible use of an automatic control circuit involving flow rates from 0.000001 to 0.1 gpm. at pressures up to 50,000 psi. The valve

is operated by Domotor standard piston operator with built-in positioner. A plug operating force of 2,000 lb. min. can be developed.—*The Amin Co., Los Angeles, 23, Calif.*



# Sets the Standard for STEAM-POWERED COMPRESSORS



This cross-section through one of the main bearings of the new XPV shows its unique lubrication system. The combination oil-pump drive and distribution system (patented) supplies oil through drilled passages directly to the crankpin and main bearings, valve-gear eccentrics, and crossheads.

All of the oil discharged from the pump passes through a fine-mesh bronze filter before entering the distribution system. The oil stays clean and bearing surfaces are protected.

Because the frame is sealed, oil stays in; and dust and dirt stay out. The oil in the crankcase keeps clean, and the smooth contours of the frame make it easier to keep clean outside.

Ever since the first steam-powered compressor of "4-corner" construction was built by Ingersoll-Rand in 1900, I-R "steamers" have been the standard of comparison. Through the following years, other models introduced such precedent-breaking improvements as: balanced piston-valve riding cut-off steam end, double-crosshead and tie-rod construction, and Channel Compressor Valves.

The new XPV sets a truly new standard of comparison. Many of the outstanding features of the old XPV have been retained because of their advantages. Many improvements have been introduced to make a superior compressor.

One of the outstanding features of the new XPV is its full-floating bearings. Main, crankpin, and crosshead-pin bearings are all free to rotate; rubbing speeds are reduced, and bearing loads and lubricant are distributed evenly around the entire bearing surface both inside and out. The wear on these non-adjustable bearings is almost non-existent, and the sealed, dust-tight frame need be opened only for inspection.

Part by part, and as a complete unit, the new XPV has been designed to compress air or gas with the greatest over-all efficiency. For further information ask the nearest I-R branch office for Bulletin 3444-A. Call upon Ingersoll-Rand engineers to prove why you should use this new XPV, the new standard of comparison.

## Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 378-1

## PIPE, FITTINGS AND VALVES . . .

**Valve, Diaphragm**

Handles corrosive liquids and gases to 125 psi. (226A)

Valve control of highly corrosive liquids, gases, slurries and food products is function of pilot-operated valve with Saunder's patent valve body. Provides absolutely tight shutoff. Valve bodies are cast iron, bronze, or stainless steel. Pipe sizes range from  $\frac{1}{4}$

to 2 in. Watertight or explosion-proof enclosures can be supplied for operating mechanism. Special sanitary construction available for food uses. Simple design has two moving parts: diaphragm and solenoid core.—Automatic Switch Co., Orange, N. J.

**Valve, Gate**

Seal stops freezing or sticking up to 10,000 psi. (226B)

No wedges, plugs or lubricants are used with the Seal-O-Ring gate valve, yet it gives a bubble-tight impassable seal. The valve operates without freezing or sticking; it can be moved with ease at all times. Primary sealing depends upon maintaining at

all times an intimate contact between the sliding precision-finished surfaces of the gate and dual sealing rings. This is accomplished by mounting the rings so that they are full-floating and self-aligning. — Grove Regulator Co., Oakland 8, Calif.

**Valve, Gate**

Nickel-iron resists mild corrosives. (226C)

Iron gate valve (125 lb.) gives economical service on mildly corrosive installations. Valve is priced considerably lower than comparable all-stain-

less or all-monel valves. Cast iron body and bonnet of valve contain 3% nickel to resist corrosion.—The Lunk-  
enheimer Corp., Cincinnati, Ohio.

**Valve, Globe and Y**

Plastic construction, corrosion resistant. (226D)

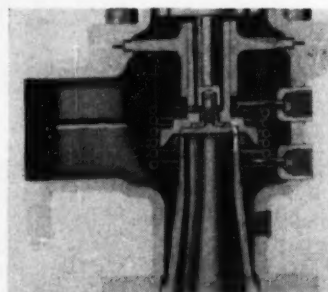
Vanilene corrosion-resistant plastic globe and Y valves are light weight and made from polyethylene. Sealing diaphragm on disk is polyethylene-polyisobutylene to give maximum re-

silience and tight seal. Valves are recommended for working pressures up to 50 psi. and temperatures to 150 F. Sizes available:  $\frac{1}{4}$ -, 1-, 1 $\frac{1}{2}$ -, 2-in.—Van-  
ton Pump Corp., New York 1, N. Y.

**Valve, Heated Safety Relief**

Built-in heat exchanger, low steam consumption. (226E)

Nozzle and semi-nozzle safety relief valves can be fitted with internal heat exchangers for keeping viscous ladings fluid. Exchanger does not interfere with valve mechanism; it operates with exceptionally low steam consumption. Exchanger consists of steel coil inserted into valve body. Coil ends are acceptable for return pipe installation or one pipe installation with a vent valve. Steam trap drains coils and construction is suitable for back pressure.—Farris Engineering Corp., Palisades Park, N. J.

**Valves, High Pressure**

Standard designs, 6,000 to 30,000 psi. (226F)

Three standard design valves for 6,000 to 30,000 psi. have been thoroughly tested out and are now being produced. Valve for 30,000 psi. has  $\frac{1}{2}$ -in. dia. port and non-rising stem. Once valve is opened it operates on

25 ft.-lb. torque. For 15,000 psi. service valve has  $\frac{1}{8}$  in. port and non-rising stem and for 6,000 psi. valve has  $\frac{1}{4}$  in. port and rising stem. All valves have Teflon impregnated packing.—Autoclave Engineers, Inc., Erie, Pa.

**Valve, Hose**

Aids transfer of corrosives. (226G)

Hose valve provides simple, inexpensive method for throttling flow of corrosive liquids. Contoured design prevents hose damage. It gives com-

plete shutoff up to 100 psi. Valve can be installed or removed without disturbing hose connection. — Carl Buck & Associates, Essex Fells, N. J.

**Valve, Hose**

Cuts off flow by pinching action. (226H)

Quick-opening valve permits manual shutoff of flow for corrosive chemicals and slurries with grain sizes up to  $\frac{1}{2}$  in. Snap action of type K valve gives bubble-tight closure. Valve is self supporting making for positive

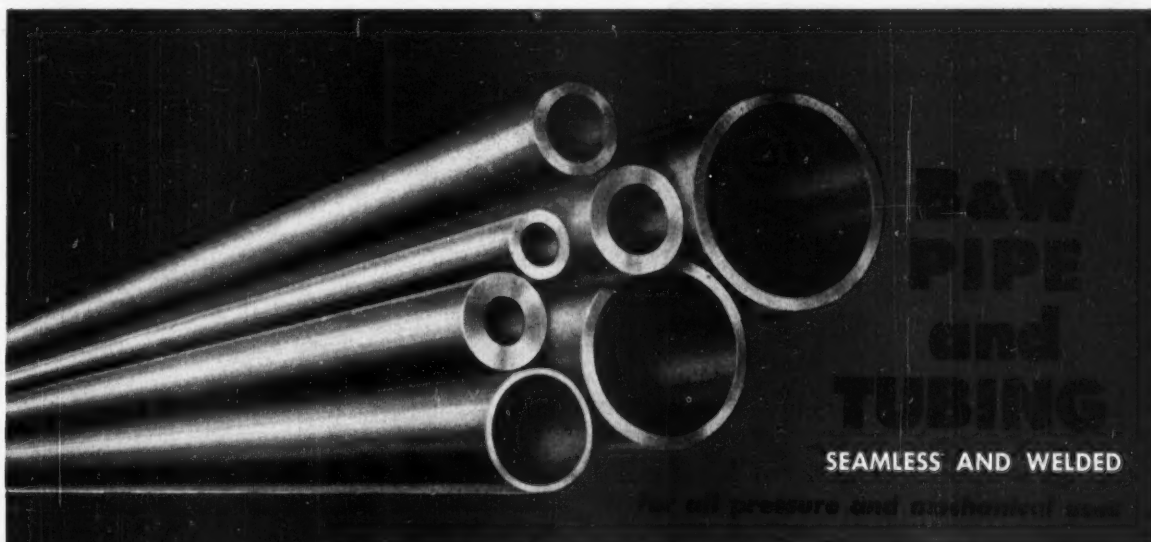
shutoff and easy installation. Only rubber contacts the liquid. Mechanical parts are aluminum with nylon bearings. Temperature limit is 180 F, pressure limit 100 psig.—Robert K. Little, Philadelphia 19, Pa.

**Valve, Multiport**

Controls ion exchange regenerations. (226I)

Regeneration cycles for water softener, filter and ion exchanger systems are controlled by a 2-in. multiport valve. Valve operation is regu-

lated by automatic electrical controls and operated by time clock.—Automatic Pump and Softener Corp., Rockford, Ill.



**TYPES:** Seamless—hot-finished, cold-drawn, or roto-rocked  
Welded—from hot-rolled or cold-rolled strip

**SHAPES:** Round, square, rectangular, oval, or other shapes

**GRADES:** Stainless Steels—B&W Croloys 12 to 27  
Intermediate Chrome Molybdenum Alloys—B&W Croloys 1/2 to 9  
SAE-AISI Alloys and Nitralloy Steels  
Nickel Steels—B&W Nicloys 3 1/2, 5, and 9  
Carbon Molybdenum Steels—in various grades  
Carbon Steels—in various grades

**SIZE RANGE:** Up to 9 7/8 inches outside diameter in a wide range of wall thicknesses.

**SURFACE FINISHES:** As rolled, as drawn, as welded, flash removed, turned, scale-free and polished.

**SPECIFICATIONS:** Made to any of the standard specifications such as those of the ASTM and U. S. Government.

**QUALITY:** Open-hearth and electric-furnace steels, including aircraft and magnaflux qualities.

**CONDITION:** Unannealed, annealed, tempered, normalized, or otherwise heat-treated as required.

**FABRICATION:** Upsetting, swaging, expanding, bending, safe-ending, and machining.



**THE BABCOCK & WILCOX COMPANY**  
**TUBULAR PRODUCTS DIVISION**

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing  
Alliance, Ohio—Welded Carbon Steel Tubing

TA-4064(G)

**PIPE, FITTINGS AND VALVES . . .**

**Valves, Needle and Globe**

Polyvinyl chloride, corrosion resistant. (228A)

. . . Needle and globe valves made of Boltaron unplasticized polyvinyl chloride are available in sizes  $\frac{1}{4}$  to 2 in. These valves are used with pipe and fittings of the same material for corrosion

and chemical resistant piping systems. Plugs, caps, unions have also been added to round out fittings line. —H. N. Hartwell & Son, Inc., Boston, Mass.

**Valve, Pipeline**

Vents air, breaks vacuum. (228B)

. . . Intake or release of air from pipeline systems is performed with Type AV air release and vacuum breaking valve. Valve automatically releases air accumulations from pipe systems, admits air to systems for breaking vacuum,

vents large quantities of air when filling systems with water. Valve is designed with 2-in. threaded inlet opening. Design pressure is 150 psi.—Simplex Valve & Meter Co., Philadelphia 42, Pa.

**Valves, Plug**

Lubricated, quick shut-off. (228C)

. . . Semi-steel and steel lubricated plug valves round out manufacturer's line of corrosion-resistant, bronze and iron valves. Valves have quick positive shut-off. All are wrench-operated, requiring

only a quarter turn to open or close the valve. Lubricant grooves surrounding each port provide a positive seal during closure.—The Wm. Powell Co., Cincinnati 22, Ohio.

**Valve, Pneumatic Control**

Has split body, new top-works, unique positioning device. (228D)

. . . Outstanding features of a line of pneumatic control valves are new top-works design and split valve body. Top-work contains an aluminum cylinder with carefully bored and honed internals. Piston is made of plastic with graphite-impregnated O-ring seal. Integral

positioning device permits static or cushion loading pressure to be in either the upper or lower cylinder. Coupled with reversible Conoplug top-works, design can cope with unbalanced loads.—Conoflow Corp., Philadelphia 3, Pa.

**Valve, Safety**

Controls excess pressure in drums of flammable liquids. (228E)

. . . Excess pressure in drums of flammable liquids is automatically controlled by Vent-A-Drum safety valve. Easily screwed into bung opening of standard 50-gal. drum, Vent-A-Drum valve does several automatic operations, among them: 1.) it allows air to escape slowly when normal temperature

causes liquid to expand; 2.) it relieves excess pressure quickly when fire or heat causes build-up of vapor pressure; 3.) it prevents entry of fire into drum; 4.) it seals off all flow of vapor and liquid if drum overturns.—Central Safety Equipment Co., Philadelphia 5, Pa.

**Valve, Safety**

Depressurizes and unloads. (228F)

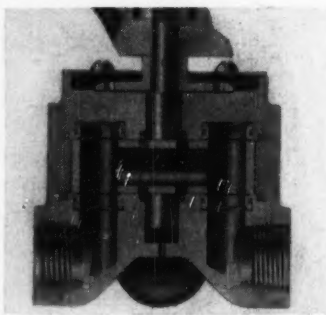
. . . The Remotor depressurizing safety valve acts in case of emergency to depressurize vessels. It can function also as an unloader where the unloading feature can be combined with the safety valve. Remotor will operate under conditions such as fire, freezing or current failure. It can be operated

remotely by air pressure; can rapidly depressurize vessels to a predetermined limit or to atmospheric pressure. Available with standard depressurizing motors are sizes from 1 x 1 $\frac{1}{2}$  to 2 $\frac{1}{2}$  x 4 in.; from 3 x 4 to 8 x 10 in. have extra-power motors.—Farris Engineering Corp., Palisades Park, N. J.

**Valve, Selector**

6,000 psi. rating, turns easily. (228G)

. . . A 6 in. handle is more than adequate for easy turning of the 1-in. Lo-Torq selector valve holding 6,000 psi. Low turning torque is obtained by balancing hydraulic pressure within the valve. Valve body encases a disk having internal flow passages. Sealing rings eliminate cross leakage within the valve as the disk is revolved. Fluid reaches both sides of the rotary disk, causing it to float in its chamber. Valve is made in sizes of  $\frac{1}{4}$  to 1 in. for 0 to 2,000 psi. and  $\frac{1}{2}$  to 1 in. for 0 to 6,000 psi. for most services.—Republic Mfg. Co., Cleveland 2, Ohio.



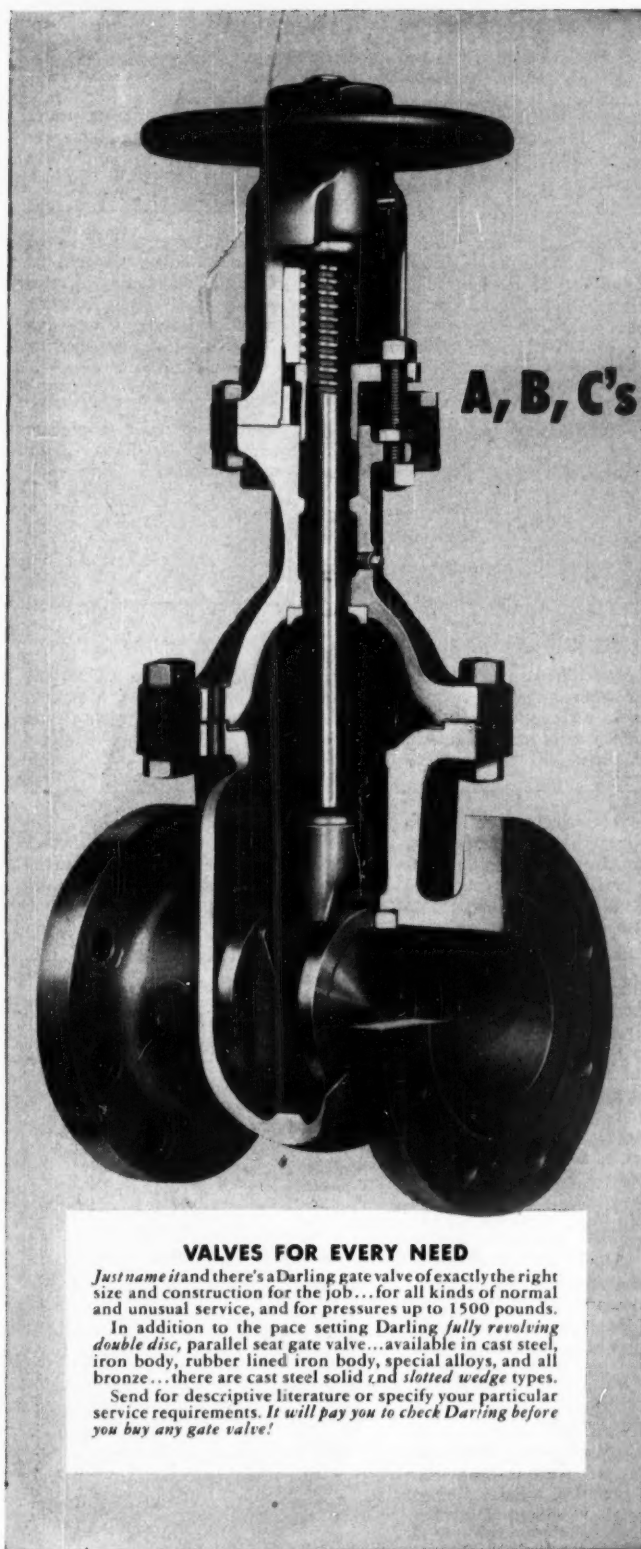
**Valve, Shutoff**

Operated by line pressure change. (228H)

. . . Either an increase or decrease in line pressure actuates Model IDPS-L automatic shutoff valve. Furnished in 8 improved basic models, valve recommended for shutoff duty on gas or liquid lines. Installation may be up or

downstream from regulator with or without static line control for either high- or low-pressure application. Valve fits existing pipe lines with negligible pressure drop.—Security Valve Corp., Los Angeles, Calif.





## A, B, C's of better valve service with **DARLING** *Revolving Disc* **GATE VALVES**

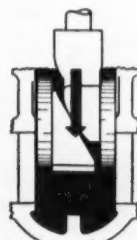


### VALVES FOR EVERY NEED

*Just name it and there's a Darling gate valve of exactly the right size and construction for the job... for all kinds of normal and unusual service, and for pressures up to 1500 pounds.*

*In addition to the pace setting Darling fully revolving double disc, parallel seat gate valve... available in cast steel, iron body, rubber lined iron body, special alloys, and all bronze... there are cast steel solid and slotted wedge types.*

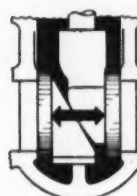
*Send for descriptive literature or specify your particular service requirements. It will pay you to check Darling before you buy any gate valve!*



GATE  
DESCENDING

### **A** EXTRA LIFE

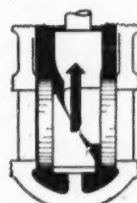
Fully revolving discs, independently hung, change seating position at each closing, assuring uniform wear distribution for prolonged service. Plain "no pocket" discs are interchangeable for *extra* life!



GATE CLOSED

### **B** POSITIVE CLOSING

Faces of the upper wedge are radiused and faces of both wedges are transversely beveled for equalized wedging pressures and tight closing despite valve body distortion.



GATE RISING

### **C** EASIER OPERATION

Wedging pressure on both discs is released before discs start to rise. Complete absence of wedging pressure during travel of discs assures easy operation and greatly prolonged valve life!

## **DARLING VALVE & MANUFACTURING CO.**

Williamsport 3, Pa.

*Manufactured in Canada by Sandilands Valve Manufacturing Co., Ltd., Galt 19, Ontario*

**PIPE, FITTINGS AND VALVES . . .**

**Valve, Steam**

Is non-fouling. (230A)

. . . Steam valve design prevents sticking—a common cause of most steam valve failure. Design automatically compensates for normal steam valve

expansion and deposits, assuring greater valve efficiency, longer life and lower maintenance costs.—Atkomatic Valve Co., Indianapolis 25, Ind.

**Valve, Steam**

High pressure, holds seal on cooling. (230B)

. . . Built-in compensation for dimension change with temperature variation permits Harper-Velan self-tightening valve to hold a tight seal at all times. Valve overcomes disadvantages of integral hard-faced welded seats. Elastic seat ring has slight downward dis-

placement when valve disk is seated tight against it. Cooling of parts, accompanied by slight retraction of valve disk following valve closure, doesn't open passage for leakage. Seat and disk are reversible.—Velan Engineering Co., Jersey City, N. J.

**Valve, Temperature Control**

Has sliding gate. (230C)

. . . Figure 80 temperature control valve has patented sliding gate that wipes across an orifice plate to assure

positive shutoff. Metallic diaphragm avoids rupture hazards.—Jordan Regulator Corp., Cincinnati 2, Ohio.

**• Process Equipment**

**Absorber, HCl**

Greater capacity, gas temperatures from -40 to +700 F. (230D)

. . . Karbate Model 8A standard falling-film absorber offers increased capacity and lower cost. Completely absorbs HCl and similar gases when handling 40 to 100% gases up to rated ca-

capacity without vent losses. One pass gravity flow used in normal operation, eliminating pump maintenance and intermediate acid storage.—National Carbon Co., New York 17, N. Y.

**Centrifugal, Continuous**

Has operating flexibility on short and long runs. (230E)

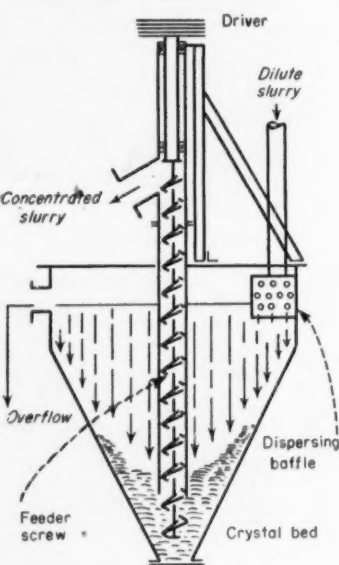
. . . Maxiflex continuous centrifugal has hydraulic-mechanical device that permits instantaneous selection of optimum differential speed between conveyor screw and separating bowl. Orifice plates are adjustable for range of

7 different pool depths. Speed is variable up to maximum centrifugal force of 2,000 times gravity. Feed chambers are self-cleaning.—Tolhurst Centrifugals Div., American Machine & Metals, Inc., East Moline, Ill.

**Centrifugal, Feeder for**

Smoother operation, finish-dried product. (230F)

. . . Concentrating feeder concentrates slurry and feeds it smoothly to centrifugal. It assures peak centrifugal performance with minimum attention. Feed rate of slurry to centrifugal is uniform despite surges in slurry rate and concentration entering feeder. Output from feeder varies automatically with changes in average rate of solids input to feeder. By feeding concentrated slurry at uniform rate, danger of unbalanced loads in centrifugal basket is overcome. Absence of orifices or throttle valves prevents plugging, eases servicing and maintenance problems. On downstream side of centrifugal need for supplementary drying equipment has been eliminated. Centrifugal dryer can be installed as integral part of the type S continuous centrifugal. Auxiliary dryer mounts directly on centrifugal housing. It delivers smooth, fast-flowing, continuous stream of product with moisture content as low as 0.01%.—Baker Perkins, Inc., Chemical Machinery Div., Saginaw, Mich.



**Classifier, Air**

Covers greater range. (230G)

. . . Improved control of product sizing is obtained with Gyrotor air classifier. Used in dry grinding circuits, unit classifies over wider particle size range. Product size is controlled by speed of

unit rotation. Good classification efficiency is aided by countercurrent flow of coarse particles and incoming feed in the annular space.—Hardinge Co., Inc., York, Pa.

## FRACTIONATING COLUMNS

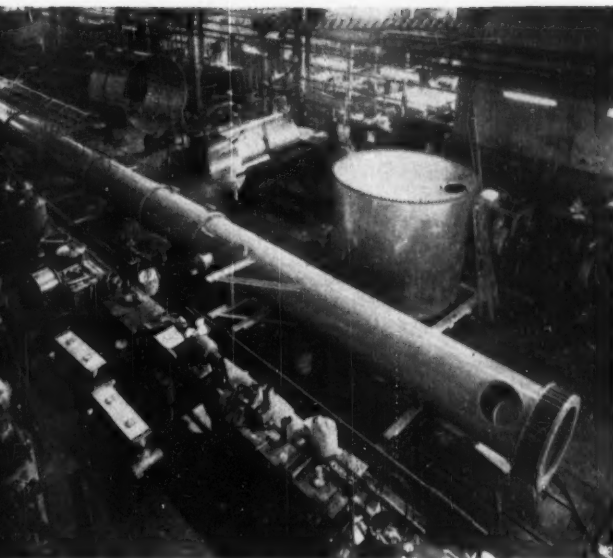
## ABSORPTION TOWERS

## VACUUM STILLS

## EVAPORATORS

## EXTRACTORS

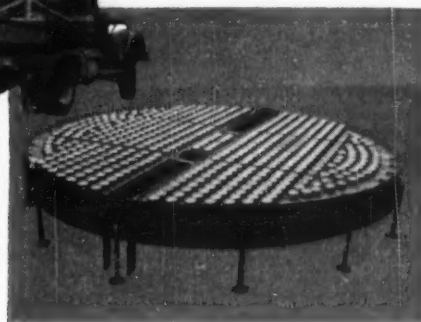
## SCRUBBERS



Top—85 foot carbon steel tower. Middle—one-piece all-monel column. Bottom—double cross-flow sectional tray.



- PREFABRICATED PIPING
- SECTIONAL TRAYS
- VAPOR COMPRESSION STILL
- EXPANSION JOINTS



*Engineering and  
Manufacturing*

Process Equipment  
of Our Design  
to Solve Your Problem

...and other processing equipment fabricated of any commercially available metal such as copper, stainless steel, carbon steel, aluminum, cupro-nickel, nickel, inconel, monel, silver, brass and bronze. Code specifications followed where applicable.

We can serve you in two ways in connection with processing equipment such as listed above and illustrated: you give us the details of your flowsheet needs and our engineers will help design the required units and then, upon approval, fabricate them; or, give us the working drawings of your own design and we'll quote on fabricating the units for you. In either case, we would bring to both design and manufacture a wealth of experience in this very kind of work and a broad knowledge of processing and an understanding of the work required of the equipment

Another major division of our service has to do with the design and construction of complete plants and processing units in many phases of both organic and inorganic processing, particularly in the fields of distillation, catalysis, extraction, crystallization, solvent gas and vapor recovery.

## BADGER MANUFACTURING COMPANY

230 BENT STREET, CAMBRIDGE 41, MASS. • 60 EAST 42nd STREET, NEW YORK 17, N. Y.

**PROCESS EQUIPMENT . . .**

**Collector, Dust**

Dust-air separation by water curtain. (232A)

. . . Improved design features have been incorporated in the Type N Roto-Clone dust collector. Separation of dust from air is obtained by means of an S-shaped water curtain. Unit is available in three basic arrangements which are identical in operating principle, but differ in hopper design and means of sludge removal. Sludge can

be removed by manual cleanout, continuous drain, or ejection by flight conveyors. Among other features are non-plugging water entrainment separators, wider range of sizes and capacities, heavier sludge ejection mechanism and sectional construction for field conversion.—American Air Filter Co., Louisville 8, Ky.

**Contact, Liquid-Liquid**

Alternately intermingles and separates immiscible liquids. (232B)

. . . Super-Centactor, a liquid-liquid contactor, is particularly advantageous in pharmaceutical and petroleum industries. From 1 to 5 extraction stages can be used, yet total working volume inside tubular bowl measures only 8 in. long by 1½ in. I. D. Stage efficiency varies with throughput. Operating speed is reached in about 1 sec. Once feed is

started only the flow rates need be monitored; all other factors are automatically fixed by manner in which bowl was initially assembled. There are no rotating seals. Complete disassembly, cleaning, reassembly done in about 5 minutes. Centrifugal force varies from 620 to 15,500 g.—Sharples Corp., Research Laboratories, Bridgeport, Pa.

**Coupling, Magnetic Agitator**

Makes reactor open easily. (232C)

. . . Quick opening for cleaning and charging is featured in Access-A-Bilt chemical reactor. Positive-locking magnetic coupling device allows agitator shaft to be split near the top. Hinged

head of vat then can be swung open like a lid. It's a one-man operation, performed without need for using overhead crane.—Stainless & Steel Products Co., St. Paul 4, Minn.

**Crusher, Impact**

Combines impact crushing, closed-circuit screening in one unit. (232D)

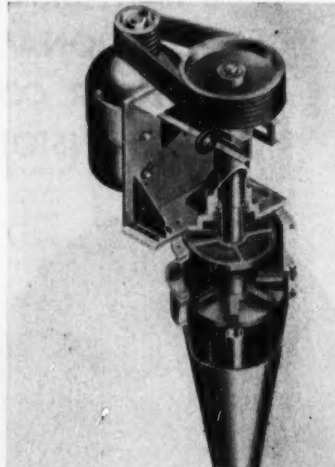
. . . For crushing to 10 mesh, Bradmill offers combination of impact crushing and closed-circuit screening in one unit. This saves expense and space normally required for closed-circuit equipment. Crusher has two rotating elements enclosed in a dust-tight housing. Inner element is a shaft fitted with paddle hammers; the outer one is a screen drum with either screening cloth or a perforated plate. Material to be crushed

is fed into the screen drum. Radial lifting blades, spaced equally around the drum's circumference, lift material to the top of the rotor. It then slides freely into the path of the impact blades. Solids crushed to final size are passed through the drum screen. Oversize stays in the drum and is returned to the impact point for further crushing.—Pennsylvania Crusher Co., Philadelphia, Pa.

**Cyclone**

Operates in 10 to 40 micron range on feeds up to 65% solids. (232E)

. . . Higher circular liquid velocities and correspondingly greater centrifugal forces at reasonable and economical horsepower input are possible with the Oliver Centriclone. Originated for clay beneficiation, cyclone classifier employs an internal impeller to get required velocities. Where conventional cyclones (based on Driessen principle) have practical operating limits of 40 to 50 fps. circular velocity, Centriclone operates as high as 120 fps. Improved separation efficiency is gained with reduced horsepower requirements. Impeller minimizes sensitivity to fluctuations in feed rate. Biggest uses for Centriclone are in tough microsieving, desliming, desanding, dewatering, classifying and thickening jobs. All machine parts subject to wear are readily renewable.—Oliver United Filters Inc., Oakland 1, Calif.



**Cyclone, Liquid**

Classifier and thickener, high capacity, minimum wear. (232F)

. . . Two-stage liquid cyclone has high efficiency and capacity at low pressure. Built with unique, short cylindrical shape that utilizes fully the powerful angular velocity of the true vortex, permits use of two stages. Less wall friction is developed than in a cone-type cyclone so that energy loss and wear are

reduced. Classification cuts are clean, approaching the efficiency of laboratory results. Particular advantage is shown in the macro range. All wear parts are made of pure, replaceable, molded gum rubber and wear is less than for other types.—Equipment Engineers, Inc., San Francisco, Calif.



**What is your  
processing  
equipment problem?**

**Sticky products?  
Corrosion chewing up equipment?  
"Custom" designs too expensive?  
Product contamination?  
Replacement costs too high?  
Cleaning takes too long?**

***There's a solution for you on this page***

## Process Engineering . . . a Pfaudler Specialty

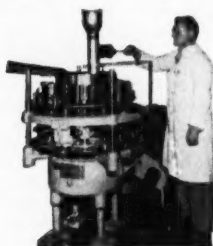
Today you can set up a new process in your plant, without adding a single extra man to your staff!

Simply turn your problem over to Pfaudler's process engineers, who design the complete equipment assembly, fabricate or procure the equipment itself, and supervise its installation and operation.

**Impartial selection of materials.** Pfaudler process engineers are trained to select the materials which are best suited to every process from the standpoint of corrosion resistance, yield and cost. They use glassed steel, other nonmetals, stainless steel or whatever choice of alloys will do the job best.

Fields in which Pfaudler process engineers have already scored success include synthetic detergent, pesticide, pharmaceutical, resin and plastic plants, waste recovery systems, solvent and acid recovery systems. They are constantly exploring new fields . . . tackling new problems . . . developing new techniques to help you cut processing costs.

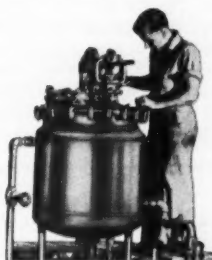
### Rotary piston filling machines



Rotary piston filler.

If you have a liquid, semiliquid or semisolid product to package in containers up to 32 ounces, there is a Pfaudler rotary piston filler to do the job. Fast, accurate filling—up to 600 cans a minute. Quick, easy to clean. Gravity flow fillers also available for free flowing liquids.

### Glassed and stainless steel reactors, storage tanks

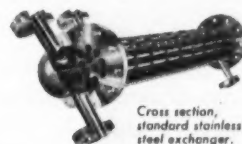


Glassed steel reactor for pilot plant.

Complete range of standard sizes from 1-gallon autoclave to 2,000-gallon heavy-duty reactors which are resistant to both acid and alkaline solutions. Duplicate laboratory yields in full-scale commercial production. Sticky products will not adhere to glass. During processing you can keep your product free of metallic contamination because Pfaudler offers a complete line of glassed steel pipe, fittings and valves.

**Learn more!** For more cost-cutting and process-improving information, make yourself known by dropping a card in the mail to us, and we'll route additional helpful data and bulletins to you, relating to your own particular interests.

### Heat exchangers, condensers



Cross section, standard stainless steel exchanger.

"Flexible standard" alloy designs provide custom-built features at a competitive standard price. Standard glassed steel designs are available for highly corrosive services.

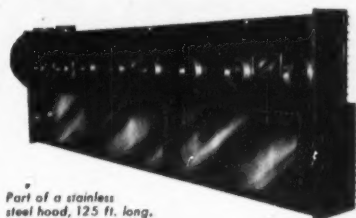
### Columns—glassed or stainless steel

For fractionation, stripping, absorption, adsorption, or extraction. You or Pfaudler engineers specify the performance you want. Pfaudler will see to it that the column (and accessory equipment) meet requirements for the job. Save time, save manpower, save money.



Glassed steel column.

### Custom-built alloy equipment



Part of a stainless steel head, 125 ft. long.

You get the wide-range benefits of complete facilities and production skills for heat treating and fabrication of stainless steel, Hastelloy, Monel, nickel, inconel, aluminum, carbon steel and clad materials which mean savings to you.

**THE PFAUDLER CO., ROCHESTER 3, N. Y.**

## PROCESS EQUIPMENT . . .

**Cyclone, Multiple Unit**

Liquid cyclone, classifies solids in 2 to 20 micron range. (234A)

... As the diameter of a liquid cyclone decreases, finer classification cuts are possible. Based on this principle the multiple unit, type TM DorrClone will produce operating results comparable to a centrifuge and offer simpler operation, control and greater flexibility; is much lower in initial, operating and maintenance costs. Individual cyclone elements in type TM DorrClone have proportions essentially identical to the larger 3 to 24 in. DorrClones. However, the extremely small diameter of the midgets dictates the nesting of a number of the elements in a common housing. All elements in a single housing are connected to common feed, overflow, underflow chambers. Multiple unit, type TM DorrClones can be arranged in one, two or three stage vertical assemblies—designated TM-1, TM-2, TM-3 respectively.—The Dorr Co., Stamford, Conn.

**Dispenser, Chlorine**

Corrosion-resistant. (234B)

... Chlorine dispenser automatically controls and mixes chlorine gas with water. Corrosion-resistant materials such as Teflon, monel, tantalum, completely protect against internal corrosion. Safety

features prevent flooding of the system by water during shutdown. Ejector, vacuum regulator and breaker are all connected to gas vent.—Fischer & Porter Co., Hatboro, Pa.

**Door, Pressure Vessel**

Opens within 30 sec. (234C)

... Quick-opening door speeds up operations requiring use of pressure vessels. Expanding-contracting split-ring closure slashes door opening time from 20 or 30 min. to 30 sec. Doors built to withstand temperatures to 400 F. and

pressures to 300 psi. Although designed for pressure use, doors adapted for use on equipment operating at atmospheric pressure or under high vacuum.—Blaw-Knox Co., Process Equipment Div., Pittsburgh, Pa.

**Dyer**

Cuts dyeing costs for cotton, wool, synthetics. (234D)

... Dyeing machine dyes cloth faster, uses less dye and takes up less space. Promises to make material and clothing cheaper for consumers. Advantages: versatility in type of dyestuffs used, flexibility, better and speedier diffusion of dye solution. Fabrics dyed so far in-

clude cotton, wool, orlon. Through-put varies from 20 to 120 yd. per min. depending on type of fabric and dyestuff. Machine still in development stage, but full-sized models now are being built.—Hussong-Walker, Davis, Philadelphia, Pa.

**Extractor, Liquid-Liquid**

Mix and settle in space-saving column. (234E)

... NRC Mix-and-Settle Extractor brings simplicity to multi-stage liquid extraction. Each tray in column operates as a pair of mix and settle stages. Individual stages have sampling cocks. Outstanding features include: provision for sampling liquid phase from each stage, separate passages between each pair of stages for flow of heating or cooling medium, ability to operate column with different temperature con-

ditions on individual stages to give temperature gradient along the column, built-in observation windows on individual stages, provision for varying flow rate and degree of agitation. Among systems already handled with this unit are phenol-lube oil, water-kerosene, caustic soda-naphtha and liquid ammonia-naphtha. And results augur well for others.—National Research Corp., Cambridge 42, Mass.

**Generator, Nitrogen**

Operates at low cost, fully automatic, explosion proof. (234F)

... Cost of producing nitrogen has been reduced through redesign of Nitronal gas generator. Both installation and operating costs are lower. New heat exchanger lowers gas dew-point from

75 to 40 F., permits use of smaller, less expensive dryers that are cheaper to operate. Generator produces pure nitrogen with controllable hydrogen content.—Baker & Co., Newark 5, N. J.

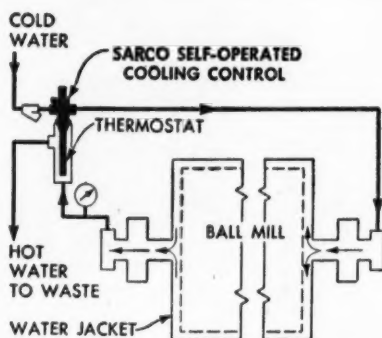
**Hammermill, Screen**

Grinds soft material, three available sizes. (234G)

... Soft material such as food products, dye colors, filter cakes, etc. can be ground to medium fineness by Ray-Ducer pulverizer. Unit is screen hammer-type mill. Mill, feeder, motors and

variable-speed feeder drive are base mounted. Although compact, there's good accessibility for inspection, maintenance. —Combustion Engineering, Inc., Raymond Div., Chicago 22, Ill.

# How to get more out of process steam



Sarco Cooling Control hook-up on ball mills at Berry Bros. Inc.

## Why it Pays to Control Water Jacket Temperature

Sometimes a process calls for cooling rather than heating. Take this typical case history.

Berry Brothers Inc., paint manufacturer in Detroit, uses ball mills to grind pigments. Using manual control, operators were unable to hold jacket water at required temperatures. Since jacket temperature affects grinding time, a costly bottleneck was created in the mill department. Grinding time varied from batch to batch.

Sarco suggested the installation of one of its self-operated temperature regulators based on the hook-up shown above.

**Results:** Cooling water is now maintained at required temperatures. Operations are faster and on a time-table basis. Installation was so successful, Sarco Cooling Controls are now installed on 19 ball mills. Meter tests made by the plant superintendent show monthly savings of \$40 to \$45 in reduced water consumption.

Sarco self-operated T-44 Cooling Control, automatically holds water at control point by close throttling of discharge flow. Ask for bulletin.



... to improve product quality, reduce production costs, eliminate bottlenecks

Make sure the steam traps and temperature controls on your process equipment have been properly specified and installed.

Here's why! Very often when production schedules are upset and steam costs seem relatively high, you'll find the trouble is not with the process equipment ... *but with the way steam is used!*

## Avoid These Production Headaches

The wrong type of trap can cause waterlogging and keep equipment from reaching and maintaining proper temperatures. Result: production slow-downs and waste of steam. Air film caused by inadequate venting drastically reduces heat transfer and prolongs processing time. Erratic temperature control is often the cause of rejects or product spoilage and further raises production costs.

## Call In Sarco

Plant after plant has benefited from Sarco's experience in the process industries. Backed by a complete line of steam traps and temperature controls, Sarco engineers are able to offer you impartial, expert recommendations on how to get more out of process steam.

For case histories describing how other plants in your field solved similar problems, write today to Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

# SARCO

improves product quality and output

2059 C

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



Thermostatic Steam Traps



Float-Thermostatic Steam Traps



Thermodynamic Steam Traps



Camlift Bucket Steam Traps



Liquid Expansion Steam Traps



Strainers



Electric Temperature Controllers



Water Blenders



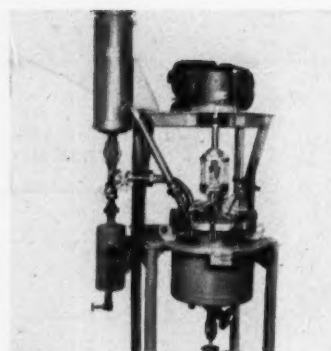
Self-Operated Temperature Controllers

**PROCESS EQUIPMENT . . .**

**Kettles, Pilot**

Two models, for resin study. (236A)

. . . Model A-110-A and Model C-10 are two pilot model kettles for development work on synthetic resins. Model A-110-A can be used both for organic reactions and synthetic resin production. It can be operated from vacuum to 100 psi. An alternate model with shock-resistant glass decanter operates from vacuum to 40 psi. Model C-10 is built primarily for phenolic resin production. Built to ASME code for internal pressures up to 25 psi, it's provided with external jacket for steam heating pressures to 150 psi.—*Brighton Copper Works, Inc., Cincinnati 4, Ohio.*



**Machine, Midget Paper**

Duplicates full-scale units. (236B)

. . . P & W Midget Fourdrinier paper machine produces experimental runs of paper, avoids tying-up full-size machine production. Quality of paper from ma-

chine is comparable to product from full-size Fourdrinier. Trim is only 9 in., saving material.—*Parsons & Whittemore, Inc., New York 17, N. Y.*

**Mill, Adjustment for Roll**

Resets easily. (236C)

. . . Complete hydraulic adjustment is provided on No. 52 TF three-roll mill. Roll pressure is shown on gages. Mini-

mum effort turns two handwheels activating hydraulic adjustment.—*Charles Ross & Son Co., Brooklyn 5, N. Y.*

**Mill, Convertible Ball-Rod**

Flexible for changing needs. (236D)

. . . Improved Denver convertible ball-rod mill flexible for use in small milling plants or as regrind mill. Size 30 in. in dia., can be increased in length from 18 to 72 in. by 18-in. increments. Type of

discharge opening can be changed by installing correct throat liner. Grate liners can be used by installing proper head and throat liners.—*Denver Equipment Co., Denver, Colo.*

**Mill, Grinding**

For lab work, 0.001-in. adjustment. (236E)

. . . Latest in line of grinding mills is designed for laboratory and control work. Through-put rates vary from 1 to 3 gph. Mill weighs 41 lbs., stands 23 1/4 in. high and has 8 1/4 in. dia. Grind-

ing done by Carborundum stone revolving at high speed against stationary Carborundum stone. Clearance varied by hand-wheel control.—*Morehouse Industries, Los Angeles 56, Calif.*

**Mill, Three Roll**

Floating or fixed center-roll operation, quick conversion. (236F)

. . . Addition to Sight-O-Matic mills makes available a universal, flexible unit. In one mill are combined ability to run either with equalized or differential pressures between 2 roll nips. Conversion from one operating method to an-

other is done by easy adjustment. Key: floating or fixed center roll. Equalized pressures obtained with floating roll, differential pressures with fixed one.—*J. M. Lehmann Co., Inc., Lyndhurst, N. J.*

**Muller, Mixing**

For development work, pressure adjustment from 30 to 80 lb. (236G)

. . . Designed with all components in direct proportion to production sized units, LF Mixmuller serves lab and pilot plant. Pressure of spring-loaded mullers can be adjusted from 30 to 80 lb. to meet range of needs. Unit can be adapted for heating or cooling. Other

features: V-belt drive, funnel for liquid addition directly to material bed, leak-proof circular discharge door for quick discharge of batch. Adjustable legs set unit at a comfortable working height.—*National Engineering Co., Chicago 6, Ill.*

**Packing, Kel-F Tower**

Good resistance. (236H)

. . . Raschig rings and perforated disks for packing support are made of Kel-F. Plates come in thicknesses up to 1 in.

and over. Hole sizes and perforation patterns varied to meet needs.—*U. S. Gasket Co., Camden, N. J.*

**Reactor, Chromatographic**




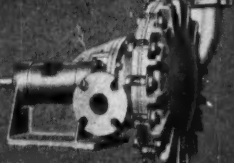
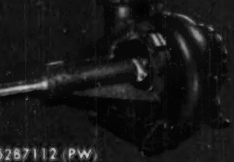
Separates rare earths, sugars commercially. (236I)

. . . Adaptation of Enley Pup reactor makes chromatographic separation commercially practical. Originally designed for producing high purity water and for investigation of ion exchange in ion exclusion processes, unit now used for separation of rare earths, sugar, antibiotics by chromatography. Fractionating column of suitable height can be

erected for carrying out desired separation. After treatment, unit can be disassembled and concentrated medium isolated for further treatment. Unit comes in diameters of 3.5 to 6 in. Acrylic resin construction permits observation of process at all stages.—*Enley Products, Inc., New York 38, N. Y.*



# Find the Best Pump for Your Process Job Here—

	TYPE	APPLICATION	SIZE RANGE	SPECIAL FEATURES
 Frame Mounted, 5286351, 5286105 Close coupled, 5286083, 5286140	<b>55B</b> Single suction Frame mounted Grease lubricated Also available close-coupled	General purpose use	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing, single or double mechanical seal. Bearings protected from corrosive or abrasive atmosphere.
 5287638, 5286105 (Multi-stage)	<b>55B</b> Single suction Frame mounted Oil lubricated	Chemical, petroleum and general purpose use in medium high temperature range	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 350 F.	Available in many materials. Choice of packing, single or double mechanical seal. Stuffing box cooled above 250 F.
 5287775	<b>Refinery Type R</b> Single suction Frame mounted Oil lubricated	Volatile liquids and high temperature process applications requiring heavy duty refinery type pump	Heads to 600 feet. Capacities to 1300 gpm. Temperature to 800 F.	Available in many materials. Choice of packing, single or double seals. Stuffing box, bearings, and pedestal may be water cooled.
 5286615	<b>P and PD</b> Single suction Frame mounted Grease lubricated	Handling fine abrasives in suspension or corrosive liquids	Heads to 260 feet. Capacities to 1300 gpm. Temperatures to 250 F.	Stuffing box on suction side. Choose packing, mechanical seal or Equiseal stuffing box — stops leakage to 15 feet suction head. Open or closed impeller.
 5287112 (PW) 5286381 (CW)	<b>PW — CW</b> Single suction Frame mounted Grease lubricated	Handling slurries and pulps which combine corrosive liquid with suspended solids	Heads to 270 feet. Capacities to 10,000 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing or mechanical seal. Easy to disassemble for inspection or repair.

## Complete Pumping Unit with Undivided Responsibility

**H**ERE'S what you can get from Allis-Chalmers: Complete pumping unit — pump, drive, motor and control — ready to install and run. You save installation time. All parts are of coordinated design... built to run together. You get one dependable guarantee of satisfaction for complete installation.

*Equiseal is an Allis-Chalmers trademark.*

Your nearby Allis-Chalmers District Office representative will be glad to help you with your process pumping problems. Or for complete information on Allis-Chalmers pumps for the chemical industry, write for the bulletins indicated in the table above. Allis-Chalmers, Milwaukee 1, Wis.

# ALLIS-CHALMERS





## PROCESS EQUIPMENT . . .

**Retort, Continuous**

Long refractory life, low upkeep. (238A)

. . . Even distribution and close control of heat give long service life to high-temperature continuous retort. No longer do contraction and expansion cause splitting and cracking of the refractories. The lining is kept prestressed to counteract forces that open cracks producing leaks. First unit built is a

vertical shaft 12 ft. high with a 3 by 1 ft. cross section. Shaft is lined with Carbofrax silicon-carbide refractory brick. Internal temperatures are well above 2,000 F. with heat transfer rates up to 10,000 Btu. per hr. per sq. ft.—Petrocarb Equipment, Inc., New York 7, N. Y.

**Sampler, Automatic**

Eliminates complicated wiring circuits. (238B)

. . . Automatic sampler works on wet or dry process streams. Cutter travels on ball-bearing wheels across 21 in. track. Motor driven time switch controls sam-

pling at intervals from 2 to 55 min. in one min. intervals. Less maintenance, more accurate sampling.—Denver Equipment Co., Denver, Colo.

**Separator, Centrifugal**

Cleans without shut-down in less than 10 sec. (238C)

. . . Titan machine is self-cleaning centrifugal separator now available in western hemisphere. Danish centrifuge is self-cleaning while operating at full speed. Sludge at any viscosity is dis-

charged with ease. Down time for bowl cleaning no longer is necessary and loss of production time is stopped.—Pitmar Centrifugal Machine Corp., Baltimore, Md.

**Softener, Water**

Largest hot-process, hot-zeolite. (238D)

. . . Unique design of Sphericone water softener gives distinct advantages in obtaining clearer and softer water. World's largest hot zeolite unit handles 200,000

gph. of water for 650 psi. boilers. It's at Bayway refinery of Esso Standard Oil Co.—Graver Tank & Mfg. Co., New York 17, N. Y.

**Sterilizer, Ultraviolet**

Simplified, cuts sterile water cost. (238E)

. . . Water sterilization on a large scale is done at low cost. Chlorination, heating and cooling, tank storage can be eliminated. Bacterial contamination is killed by powerful ultraviolet rays.

Unit can process up to 7,000 gph. Stainless steel sterilizer is designed for easy maintenance and ultraviolet lamp replacement.—Aquafine Co., Los Angeles 21, Calif.

**Tower, Fume Washing**

Light and compact, Intalox saddle packing. (238F)

. . . Fume washing tower for general lab and industrial use is light weight, compact and portable. Tower, furnished with metal support stands, consists of bottom, one or more packed intermediate, distribution and top sections. Coating of Tygoflex plastic protects all

metal surfaces inside and out. Intalox saddle tower-packing gives 60 to 65% less pressure drop than Raschig rings. Standard sizes have 20- and 30-in. diameters with rated capacities of 750 and 1,650 cfm. of air.—U. S. Stoneware Co., Akron, Ohio.

**Vaporizer, Chlorine**

Sold as package, steam-actuated. (238G)

. . . Whitlock standard chlorine vaporizing system converts 2,000 lb. per hr. liquid chlorine into dry vapor. To install: connect steam condensate, vent and chlorine lines. Unit operates on

5 psig. steam. Vaporizer delivers dry, superheated chlorine at rated capacity. This precludes condensate and eventual corrosion.—The Whitlock Mfg. Co., Hartford, Conn.

## Your Inventory of New Equipment and Accessories

## What It Contains . . .

This inventory digests some 371 of the most important new or improved equipment items developed or commercialized during the second six months of 1953 and the first six months of 1954. It stresses only those developments of major interest to chemical engineers in the chemical

process industries. For more about any item, write its code number on one of the Reader Service postcards (p. 35) then mail to us.

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# A Complete Package sized to your Job



## Precise Grinding — Smooth Blending — Clean, Cool Air Conveying — Optimum Dust Collection All Unified In a Single MIKRO System

This One-Package MIKRO method of engineering welds three separate functions into a coordinated and completely automatic processing system which eliminates the cost of manual handling. It guarantees the delivery of a product to meet your most exacting specifications without any loss of material in process.

The basic grinding unit . . . either a MIKRO-PULVERIZER or a MIKRO-ATOMIZER . . . blends and grinds with ease, safety and economy and offers you a wide range of particle sizing from granular to ultra-fines.

The ground material is whisked away by the MIKRO-Airacón from any given source to any point of discharge.

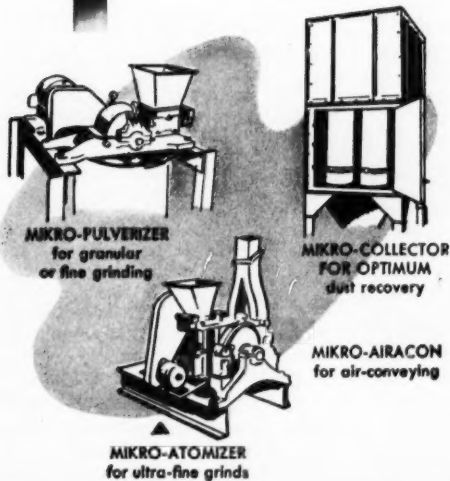
In the MIKRO-COLLECTOR, where the material is filtered the reverse-jet air ring operation provides the maximum in product recovery. Here you have granular and fine powder collection at its best.

This complete MIKRO "package" thus affords you an answer to many processing and materials handling problems. The service and facilities of the MIKRO Laboratory are at your disposal, without obligation, to help obtain the best answer for you.

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# MIKRO

PULVERIZING MACHINERY DIVISION  
METALS DISINTEGRATING COMPANY, INC.  
55 CHATHAM ROAD SUMMIT, NEW JERSEY





## • Pumps, Blowers and Compressors

### Blower, Axial

Moves hot contaminated air. (240A)

... Air at temperatures up to 350 F. can be moved by Vaneaxial blower without damage to unit. Also unit handles air containing acids, alkalis or fine abrasive dust. Blower is modification of standard belt-drive Vaneaxial blower. Guide vanes are contained in

special dummy section. Drive is located on negative pressure side of blower. With this arrangement clean air from outside ducts is drawn through belt tube and over bearings. Long life and trouble-free operations assured.—Hartzell Propeller Fan Co., Piqua, Ohio.

### Blowers, Exhaust

Withstand corrosion and abrasion. (240B)

... Two complete lines of exhaust blowers cover wide range of corrosive and abrasive service. One line handles simple ventilating as well as moderately corrosive jobs, is protected by a choice of baked phenolic resin, vinyl resin or tough latex material. Capacities run

from 300 to 7,000 cfm. On the second line a choice of natural and synthetic rubbers protects against sulfuric, hydrofluoric and other rough mineral acids. Here capacities range from 750 to 54,000 cfm.—Heil Process Equipment Corp., Cleveland 11, Ohio.

### Compressor

More powerful, driven by turbocharged engine. (240C)

... A power increase of 50% over the largest previous 4-cycle gas-engine-driven compressor is claimed for the new 2,000 hp. type 412 KVS compressor. Turbocharging makes possible more power combined with compact size and economical performance. Ex-

haust gases drive gas turbines coupled to centrifugal blowers located at either end of the engine. Air from the blowers scavenges the cylinders, cools pistons and valves at the end of the exhaust strokes.—Ingersoll-Rand, New York 4, N. Y.

### Compressor, Air

For stationary duty. (240D)

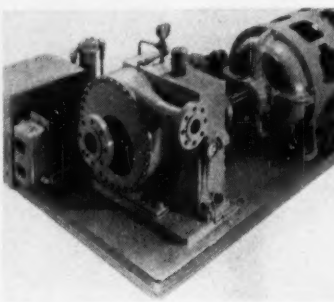
... Model 25D stationary air compressor has displacement of 128 cfm. Unit is direct-connected to 25-hp. electric motor. Compressor has V-type de-

sign with 7½ in. low pressure and 4½ in. high pressure cylinders. Unit furnished complete, ready for mounting.—Davey Compressor Co., Kent, Ohio.

### Compressor, Recycle

Assembled from standardized components. (240E)

... Line of low-flow, high-pressure centrifugal compressors has standardized designs for impellers, housings, diffusers, bearings, gears, and shafts. Parts thus are interchangeable and the capital investment is kept low. Three different impeller designs with different aerodynamic characteristics increase the flexibility of the compressors. Units will meet all recycle requirements in a range from 25 to 250 hp., flows as low as 100 scfm., pressure as high as 600 psig, and temperatures up to 700 F.—Sawyer-Bailey Corp., Buffalo, N. Y.



### Compressors, Rental

Standby equipment. (240F)

... Sudden failure of air compressing equipment no longer needs to cause costly shutdowns. Different makes of air compressors over a wide range of sizes now are immediately available for

prompt installation on a short-term rental basis. This keeps your plant operating during repair or replacement of equipment.—Air Compressors & Motors, Inc., Cleveland, Ohio.

### Compressors, Valve-in-Head

Easy to service, better cooling and lower temperature. (240G)

... Class ATH air and gas compressors are easy to service, have better cooling. Machines employ sectionalized cylinders arranged in three pieces. Inlet and discharge valves are located in front and back heads. Since the cylinder is sectionalized and readily disassembled,

the liner (standard) is speedily removed. It's unnecessary to disconnect either the inlet or discharge air piping. This means that any service problem involving piston rings, pistons or liners is a minor operation.—Pennsylvania Pump and Compressor Co., Easton, Pa.

### Ejector, Pneumatic

Cycles automatically, for small flow volumes. (240H)

... Pneumatic ejector for small flow volumes of problem materials is Pneu-Pump. Compact design and only one moving part (ball inlet valve) make pump simple to install and operate. Operation is automatic. Pumps are

available with choice of cast iron, lead-lined, rubber-lined or stoneware bodies. They're adaptable to pumping corrosives. Auxiliary apparatus permits operation with steam rather than air.—Yeoman Bros. Co., Melrose Park, Ill.



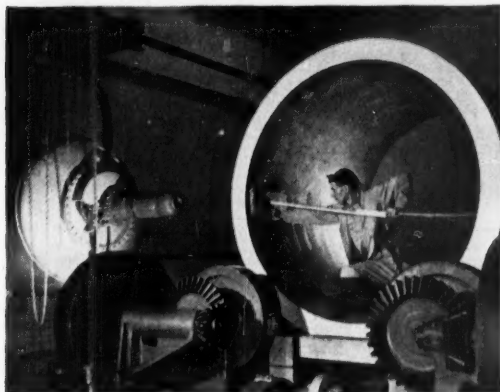
# Process Equipment that meets *TODAY'S* Requirements

## B&W Accumulators • Alloy Castings • Hollow Forgings

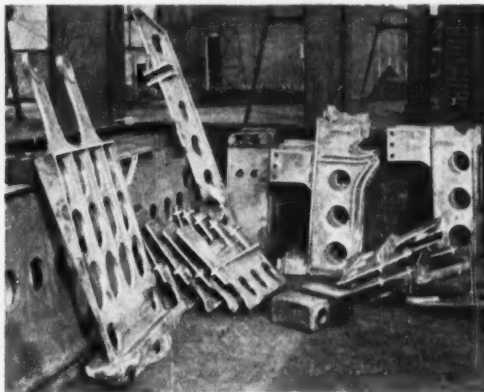
The constant progress being made within the process industries demands the utmost of the engineers responsible for the dependability, efficiency and economy of the equipment that serves today's process industries' requirements.

At B&W, forming, machining, welding, X-ray-

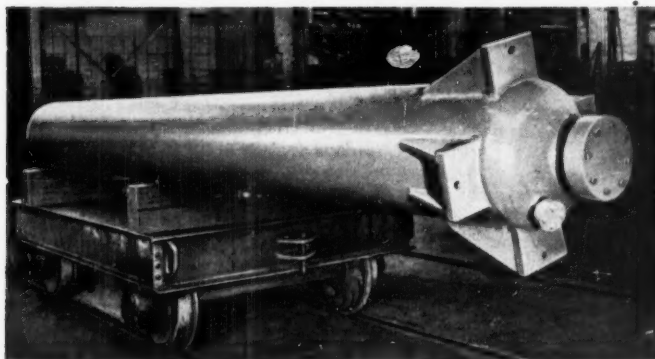
ing and stress relieving are all performed on equipment specially designed for the job, much of it developed by B&W. And for temperature and pressure problems that arise, new and practical solutions are continually being developed through designing skill based on long experience.



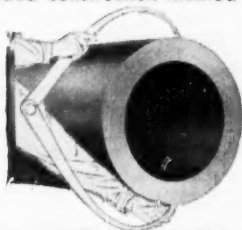
2,000,000-volt X-ray is the all-seeing eye that checks the soundness of welds.



B&W Alloy Castings are cast-to-last . . . designed for long life under the most rigid service conditions requiring superior resistance to abrasion, corrosion, oxidation, high pressures and high temperatures.

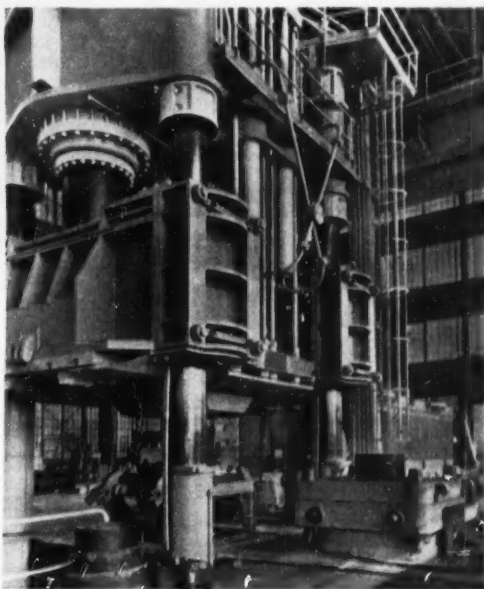


B&W Accumulators are manufactured in the range from 500 to 6000 psi or higher, with capacities from 5 gallons to 10,000 gallons. Large accumulators designed to withstand higher pressures are fabricated by the banded construction method unique with B&W.



These large-diameter, heavy-wall pipes or tubes offer the designer the advantages of single lengths or many lengths, "tailor-made" to his requirements . . . prompt delivery even on small orders . . . full forging properties resulting from thorough working of the metal . . . excellent concentricity . . . wide size range available. Supplied in a wide range of carbon and alloy steels.

*Write for detailed information about the B&W equipment you need to keep your plant in best condition to meet today's competition. The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.*



B&W's giant new press, used in making Hollow Forgings, and other products needed to meet industry's growing demands.



S-432

**PUMPS, BLOWERS AND COMPRESSORS . . .**

**Fan, Propeller-Type**

Works against higher pressures. (242A)

. . . Propeller type fan effectively moves air against pressures as high as 4 in. of water. Ability to work against pressure lies in propeller design. Fan is fitted with curved orifice air-seal ring to

eliminate back flow of air at propeller tips. Vibration-absorbent motor mounting is streamlined to minimize obstruction of air streams.—*Hartzell Propeller Fan Co., Piqua, Ohio.*

**Impeller, Pump**

Corrosion-resistant chlorinated polyethylene. (242B)

. . . All-Chem pumps are now furnished with impellers constructed of DuPont's Hypalon, a chlorinated polyethylene polymer. Hypalon is dimensionally stable up to 160 F.; permits pump op-

erating pressures to 150 psi. Impellers are ideal for handling chlorine dioxide; chromic, nitric and sulfuric acids; pickling solution.—*Eco Engineering Co., Newark, N. J.*

**Pump, Centrifugal**

Has molded rubber liner. (242C)

. . . Centriseal pump operates without sealing water, is suitable for pumping abrasive or corrosive slurries. All pumping parts are protected by molded Maximax rubber. Rubber linings are molded

to shape and mechanically locked in position. Mechanical parts of pump are interchangeable with those of Hydroseal pumps.—*The Allen-Sherman-Hoff Pump Co., Wynnewood, Pa.*

**Pump, Centrifugal**

Plastic, for liquids up to 265 F. (242D)

. . . Fluid end parts of centrifugal pump are constructed of chemical and thermal shock-resistant plastic material. Plastic composition: phenol-formaldehyde or furfuryl-alcohol resin and inert filler of asbestos or graphite. Pump is designed for mechanical seals, easily installed and serviced because of large drip pan. Long

heavy bearing housing insures perfect alignment. Pump made with 3 in. suction and 2 in. discharge. At 1,750 rpm., pump will handle capacities up to 300 gpm. and heads to 110 ft. Liquid temperatures can be as high as 265 F.—*Centrifugal Pump Div., Mission Mfg. Co., Houston, Tex.*

**Pump, Centrifugal Chlorine**

Completely excludes moisture. (242E)

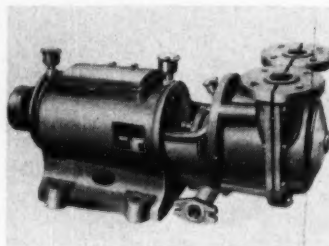
. . . Recently developed centrifugal pump completely excludes moisture from the chlorine being handled. Moving parts of the unit are immersed in the liquid. Rotor of motor is sealed into the liquid system by a non-magnetic stainless-steel diaphragm in the

air gap. Unit can be mounted on manholes in storage tank for transferring chlorine to tank cars, ton tanks or cylinders. Bypass line on pump holds temperature constant.—*Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles 31, Calif.*

**Pump, Chemical**

Self-priming after initial startup. (242F)

. . . No priming of the suction line is required in the new RE-Sa chemical pump. Designed for emptying vats, tank cars, acid containers and deep subterranean tanks the pump draws liquids over considerable heights. Wetted parts of the pump are made of alloys best suited to withstand corrosion on the specific job. Pump is normally equipped with flanges. However, hose connections can be furnished on request.—*Neumann & Welchman, Fair Lawn, N. J.*



**Pump, Close-Coupled**

Permanent alignment of motor and pump, interchangeable parts. (242G)

. . . Motor and pump are combined in one close-coupled mounting on Fig. 3642 centrifugal pumping unit. Pumping range is 110 gpm. max. at heads up to 110 ft. Mechanical shaft seals are

used and discharge nozzle can be turned to any one of eight positions. Discharge outlets tapped to accommodate 1 or 1½ in. pipe.—*Goulds Pumps, Inc., Seneca Falls, N. Y.*

**Pump, Controlled-Volume**

For high flow and pressure. (242H)

. . . Controlled volume simplex model pump provides a range of 1,450 gph. at 470 psi. to 14 gph. at 50,000 psi. Unit is also available in duplex for double

these capacities over same pressure range. Capacity varied while running by either manual or automatic means.—*Milton Roy Co., Philadelphia 18, Pa.*

**Pump, Controlled-Volume**

Operates fully submerged, 3 to 3,200 ml. per hr. (242I)

. . . Variation of standard controlled-volume pump is entirely submerged to prevent stuffing box leakage. Submerged miniPump simplifies controlled volume pumping of dangerous corrosive fluids.

On the pump only the driver and discharge piping are exposed above the liquid level. Regulation of capacity can be either manual or automatic.—*Milton Roy Co., Philadelphia 18, Pa.*

from 8,000 to 40,000 lbs./hr.

with **SUPERIOR** PACKAGED  
WATER-TUBE STEAM GENERATORS

Dedicated solely to production of factory-assembled, factory-tested steam generators, Superior Combustion Industries, Inc. offers the widest available selection of types and sizes. This specialization results in the highest standards of quality and performance.

#### TYPE D

For oil, gas or combination of fuels, Superior D-Type Boilers provide features previously unavailable.

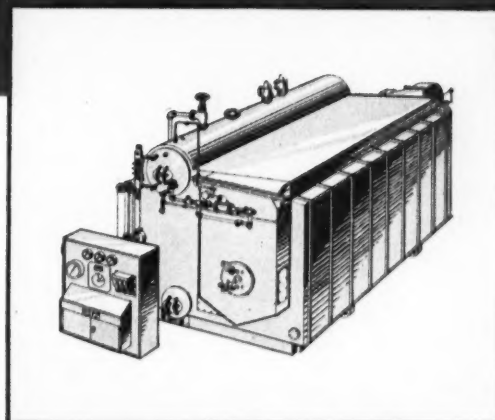
A centrifugal forced draft fan at rear of boiler is connected by air duct over the furnace roof to firing front. Result:—Quiet operation, preheated air supply, and working space at firing front.

Fast steaming, plus ability to handle fluctuating loads are characteristics of Superior D-Type Boilers. A large furnace with tangent tubes absorbs released heat rapidly. Furnace water wall tubes are riser elements, discharging directly into the steam drum, producing rapid circulation. Balance of heat absorbing surface to refractory material, in a correctly proportioned furnace as produced by Superior, assures maximum combustion efficiency. Results:—Low cost steam, minimum maintenance, and high availability.

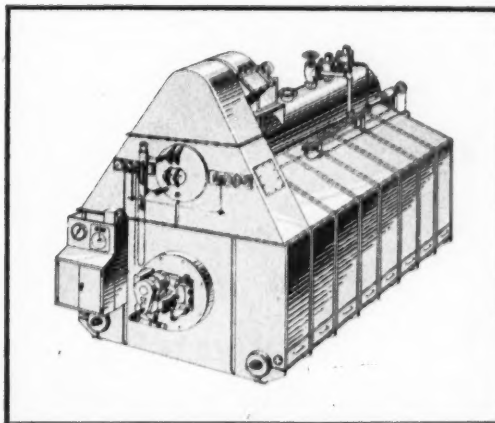
#### TYPE A

Employing time-tested principles of the Express boiler, Superior's A-Type packaged steam generator, by reason of its unobstructed floor construction, permits conversion from gas or oil to solid fuel firing not possible with other types. Water walls are formed of double rows of tubes on both sides of the furnace. Use of alloy baffles between furnace and tube banks eliminates refractory and its maintenance.

Utilizing induced draft, these units are ideal for fully automatic installations in hospitals, schools and other public buildings where the quiet operation typical of rotary-cup, induced-draft firing is mandatory.



For details, write for Catalog 622-D



For details, write for Catalog 622-A

for performance you can **BANK** on

**SUPERIOR COMBUSTION INDUSTRIES INC.**  
TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

**SUPERIOR**  
STEAM GENERATORS

## PUMPS, BLOWERS AND COMPRESSORS . . .

**Pump, Diaphragm**

Built as packaged unit.  
(244A)

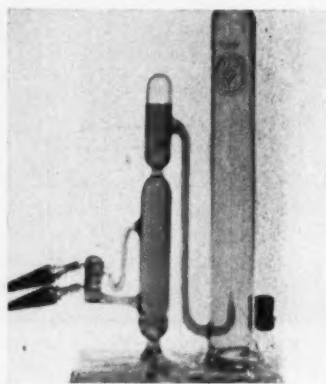
. . . Simplified design—offered as packaged unit—highlights advantages of diaphragm pumps. Pump, two-pole automatic pressure switch, motor and belt drive are all mounted on rugged

steel base. Combination vacuum and pressure chambers provide cushion for incoming and outgoing fluids. Operating noise level is reduced.—W. S. Rockwell Co., Fairfield, Conn.

**Pump, Heat Activated**

Ideal for corrosives, low cost.  
(244B)

. . . Thermopump, a heat-activated pump, now handles increased pressures and flow rates. It can be made entirely of glass, has no moving parts except check valves. Pump can be hermetically sealed, is ideal for handling corrosives. Thermopump is particularly suitable where waste heat is available as power, where silent operation is essential, where electricity or mechanical power are not conveniently available. Because of low efficiency compared to mechanical pumps, Thermopump is not intended for universal application. But in small models it pumps up to 8 gph. of fuel oil at pressures to 25 psi. Both initial and operating costs are low.—Jet-Hcet, Inc., Englewood, N. J.

**Pump, Hermetically Sealed**

Fluid bearing, handles any liquid.  
(244C)

. . . Hermetically sealed pump-motor units incorporate two new design concepts. First is a fluid-piston radial bearing consisting of a tubular rotating shaft supported by fluid pressure so that it floats concentric with stationary bearing shaft. Second concept is canned motor principle where rotor of induction motor rotates in fluid being pumped and is cooled by same fluid. Motor stator windings are located outside a non-magnetic stainless-steel shell surrounding rotor. With this construction, no packing seals are required

and rotation elements of pump and motor can be included in one hermetically sealed shell. Units can pump non-abrasive liquids with densities varying from that of gasoline to mercury. Temperature limits range from 100 to 1,500 F.; operating pressures up to 2,000 psi. have been used. Pumps are available in two general types; general purpose unit for liquid temperatures of 1,000 F. or less and multi-purpose unit for temperatures ranging up to 1,500 F.—Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

**Pump, Industrial**

Bronze, water. (244D)

. . . Model 4300 industrial bronze pump with scoop rotor and rubber roller vanes handles continuous water recirculation

jobs. Pump delivers 7 gpm. at 50 psi. and 1,750 rpm.—Hypro Engineering, Inc., Minneapolis 1, Minn.

**Pump, Mechanical Vacuum**

Doesn't condense vapors.  
(244E)

. . . NRC rotary gas-ballast pump will pump condensable vapors without oil contamination or loss of pumping capacity. Condensation of water vapor is prevented by keeping the vapor pressure below the dew point. Pumps are of-

fered in single-stage units with capacities from 2 to 400 cfm., in compound units with capacities from 2 to 15 cfm. and in combination units with capacities from 30 to 400 cfm.—National Research Corp., Cambridge, Mass.

**Pump, Proportioning**

Costs less, delivers controlled volumes up to 12 gph.  
(244F)

. . . Model 100 chemical proportioning pump combines body and head in one casting. This cuts pump price by 30%. Spring-loaded packing arrangement eliminates packing nut adjustment. Packing replaced without moving any major pump components or disconnecting any piping. Perforated disk keeps

ball check valves in valve pockets, eliminating possibility of a spring popping off a ball and jamming open a valve. Pump operates up to 300 psi., delivering controlled volumes up to 12 gph. Pump mounted on 12-in. channel base.—The Neptune Pump Mfg. Co., Philadelphia 20, Pa.

**Pump, Proportioning**

Has inexpensive wet end, 0-100% stroke adjustment.  
(244G)

. . . Little Giant proportioning pump is designed for water softening, boiler treatment and all chemical applications up to 800 psi. Ball and seat design features efficiency and economy. Suction and discharge sides consist of in-

tegral ball and seat units. These are easily removed with large standard screwdriver. Replacement makes a practically new liquid end at low cost.—Orchem Pump Div., Orlich Bros. Machine Works, Philadelphia, Pa.





Instant  
automatic release  
of  
**EXCESS  
PRESSURE**

## Precious Metal Rupture Discs

If the liquids or gases you deal with in your pressure equipment are in the slightest degree corrosive, only corrosion-resistant precious metal rupture discs will provide absolutely dependable protection against excess pressure. Where discs of base metal alloys, even stainless steel, are attacked and rendered dangerously inaccurate by corrosion, precious metal discs will maintain their accuracy intact. Baker Precious Metal Rupture Discs

are precision-made to your specifications for pressures from a few pounds to several thousand pounds. The precious metal is recoverable, with high resale value, so that the additional final "use" cost of this dependable protection is negligible.

Send for the free booklet, "Baker Rupture Discs." Information and data to help you select the type of disc that will give you absolute protection.



113 AS10R STREET, NEWARK 5, NEW JERSEY • NEW YORK SAN FRANCISCO CHICAGO LOS ANGELES

CHEMICAL ENGINEERING—Inventory Issue 1954

Inquiry Code Number for this advertisement—245

245

**PUMPS, BLOWERS AND COMPRESSORS . . .**

**Pump, Rotary**

Two additions to standard line. (246A)

. . . Rotary pump line extended by addition of 3600 series MAHBRV Nos. 5 and 6 motor driven units. Pumps

range from 70 to 226 gpm. at 60 psi. Each size has three gear ratios.—George D. Roper Corp., Rockford, Ill.

**Pump, Self Priming**

Made of plastics. (246B)

. . . Offering low cost and long life, series of plastic pumps is offered with  $\frac{1}{2}$ -in. port sizes. It delivers up to 350

gph. at 10 ft. head, 1,750 rpm. Only moving part is neoprene impeller.—Jabco Pump Co., Burbank, Calif.

**Pump, Self-Priming**

Simple, rapid, self priming. (246C)

. . . Self-priming centrifugal pump claimed to be simplest unit of its type ever developed. Only components inside volute case are the impeller and seal. Efficient volute design makes possible greater capacity, faster priming and

more trash-handling ability. Unit is light and compact. Sizes and capacities range from  $1\frac{1}{2}$  in. (5,500 gph.) to 10 in. (250,000 gph.). Units furnished for either direct or belt drives.—Ralph B Carter Co., Hackensack, N. J.

**Pump, Sigmamotor**

Larger size for tubing up to 1 in. dia. (246D)

. . . Larger model of Sigmamotor pump handles flexible tubing up to 1 in. dia. Model has hinged top so that tubing can be placed against pumping fingers without disconnecting either end. No connections at pump are

necessary. Liquid is pumped from one receptacle to another by placing connecting tubing in pump. Fluid in tubing never contacts pump. Sigmamotor pumps solutions of liquids, solids, gases.—Sigmamotor, Inc., Middleport, N. Y.

**Pump, Slurry**

For abrasive slurries, improved flow, reduced wear. (246E)

. . . Line of slurry pumps handles fine abrasive slurries over wide range of head conditions. Especially designed impeller volutes give improved flow and reduced wear. Low electrical demands minimize

operating costs. Abrasion resistant Gasite alloys used in construction. Design favors simplicity of maintenance. Pump sizes vary from 2 to 14 in.—Georgia Iron Works, Augusta, Ga.

**Pump, Standard**

Used for gas sampling. (246F)

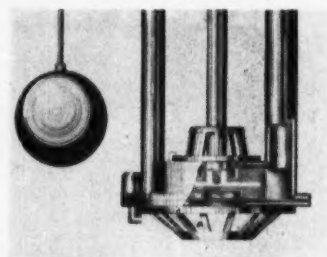
. . . Vanton pumps now are used for gas sampling work. Design of pump provides complete isolation of gas sample from working parts. Eccentric shaft and rotor assembly exert squeezing action on precision-molded flexible liner. Gas trapped between outer surface of flexible liner and inner surface of body block is progressively squeezed

through the pump. For continuous operation, or use on relatively high vacuum or discharge pressure, liquid seal is provided. Body blocks are polyethylene, Bakelite, or high temperature-resistant buna N hard rubber. Liner materials include gum and natural rubber, neoprene, silicone.—Vanton Pump Corp., New York 1, N. Y.

**Pump, Sump**

Acid-proof, overhung suspended shaft. (246G)

. . . Acid sludges, corrosive and foamy products with solids in suspension and other types of difficult pumping jobs are handled by acid-proof sump pump. Unit operates at heads up to 35 ft. and flows to 75 gpm. Pump is completely rubber-lined and covered. Overhung suspended shaft design eliminates all submerged bearings, packings and other parts that normally might be expected to cause trouble.—The Galigher Co., Salt Lake City 4, Utah.



**Pump, Vacuum**

For large volume dehydration and vacuum metallurgical systems. (246H)

. . . Single-stage oil ejector pump type KB-1500 is specifically designed for use in large volume dehydration and vacuum metallurgical systems. Outstanding feature is high pumping speed in pressure range from  $6 \times 10^{-2}$  to  $5 \times 10^{-2}$

mm. Hg. Pump can produce an ultimate pressure of  $5 \times 10^{-2}$  mm. Hg. while operating against a limiting fore pressure of 0.5 mm. Hg. Air removal rate exceeds 3,000 cfm.—Consolidated Vacuum Corp., Rochester 3, N. Y.

**Pump, Vacuum**

High vacuum booster in low-pressure range. (246I)

. . . Model MB rotary positive displacement pump equipped with mechanical shaft seals used as a high vacuum booster stage in the low-pressure range. Unit exhausts into inlet of a single-stage or backing pump. First unit produced

runs with a single-stage 125 cu. ft. pump to produce a blank-off pressure of 0.1 micron McLeod gage. Combined unit has wider range, uses less power.—Kinney Mfg. Div., New York Air Brake Co., Boston 30, Mass.

# LIQUIDS TO POWDER

with Turba-Film  
Evaporator and  
Rodney Hunt  
Spray Dryer

Typical of many drying processes done rapidly and efficiently with Rodney Hunt equipment is the production of powder from liquid concentrate as illustrated.

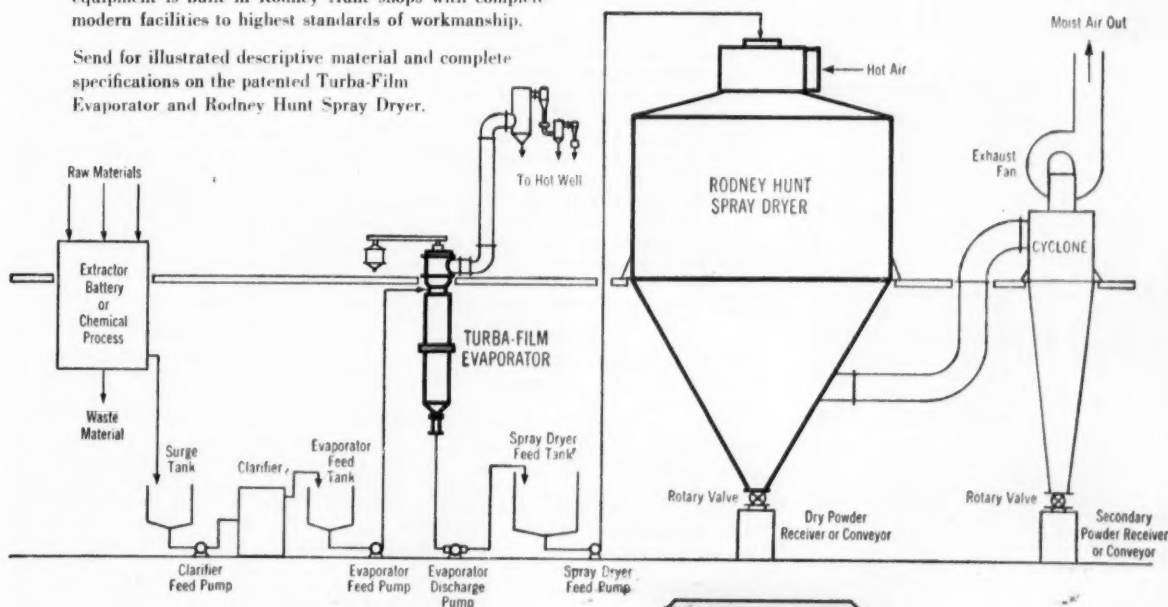
The TURBA-FILM® Evaporator is a unique application of the falling film principle. It operates over a wide range of temperature, pressure and viscosity. Sensitive materials are so briefly exposed to heat that there is no impairment of original qualities. Distillation, cooling, stripping, deodorizing and de-aeration, as well as concentration, are accomplished in a single pass. The thin film, the small quantity in process at any time, and centrifugal separation eliminate difficulties due to foaming and frothing. TURBA-FILM evaporating capacities run from 40 to 5000 pounds per hour.

The Rodney Hunt Spray Dryer delivers powder which is homogeneous, highly soluble, sized to specification, and in the form of particles or dust-free hollow beads. Even slurries can be handled advantageously. Common heat sources such as gas, oil and steam are used successfully and economically.

Rodney Hunt engineers make available to you the experience of years in the engineering of many evaporator and spray dryer installations. Rodney Hunt equipment is built in Rodney Hunt shops with complete modern facilities to highest standards of workmanship.

Send for illustrated descriptive material and complete specifications on the patented Turba-Film Evaporator and Rodney Hunt Spray Dryer.

Schematic drawing of Continuous Drying System shows Rodney Hunt Extractors, Turba-Film Evaporator and Rodney Hunt Spray Dryer for converting liquid to soluble powder. Extraction produces a true solution with low solids. The Turba-Film Evaporator reduces the solution to desirable higher solids. The Rodney Hunt Spray Dryer reduces the concentrated solution to a powder with the final desired low moisture content.



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**RODNEY HUNT MACHINE CO.**

31 VALE STREET, ORANGE, MASSACHUSETTS, U. S. A.

**PUMPS, COMPRESSORS AND BLOWERS . . .**

**Pump Body, Rubber**

For acids, caustic to 225 F. (248A)

. . . Series PXHR Vanton pumps use newly developed Buna N hard-rubber body block. Pump, widely used for HCl, HF, H<sub>2</sub>SO<sub>4</sub>, and other corrosives, was formerly available only with polyethylene and graphite-filled Bakelite bodies. With new Buna N hard-rubber

body block, additional rigidity and shock resistance are obtained. Pump capacities run from  $\frac{1}{2}$  to 20 gpm. with pressures from 0 to 60 psi. All pumps are self-priming with suction lifts up to 24 in. Hg.—The Vanton Pump Corp., New York 1, N. Y.

**Pumps, Chemical**

Wide range of models, fit most needs. (248B)

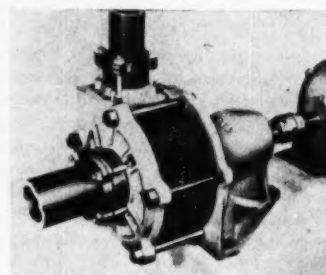
. . . Line of end-mounted pumps is suitable for handling acids, caustic solutions, solvents and liquified gases. These regenerative turbine pumps are available in 27 models for heads up to 600 ft. in a single stage and capacities from

1 to 100 gpm. All models are fitted with high-pressure flanged connections. Mechanical seals can be chosen from seven different types. There is a wide variety of construction materials.—Roy E. Roth Co., Rock Island, Ill.

**Pumps, Graphite Centrifugal**

Easy to install, operate and maintain. (248C)

. . . New Karbate pump models are practical for ordinary as well as for severe corrosive conditions. They cover a wide capacity range and are easier to install, operate and maintain. Type C heavy-duty pump has high degree of parts standardization. Type F motor-mounted pump combines features of closed-coupled pump with those of top-quality frame-mounted unit. Pumps can handle from 5 to 1,500 gpm. at discharge pressures to 1,000 psi.—National Carbon Co., New York 17, N. Y.



**Pumps, Vacuum**

For emergency, test equipment, up to 4,000 cfm. (248D)

. . . Vacuum pumps available as truck-mounted units for use as emergency or test equipment. Two models: smaller handles more than 2,000 cfm. between 1 and 10 microns absolute pressure;

larger more than 4,000 cfm. between 1 and 10 microns pressure. Mechanical and diffusion pumps are combined in one unit.—F. J. Stokes Machine Co., Philadelphia 20, Pa.

**Pumps and Valves**

First in this country, unique design, special alloys. (248E)

. . . Outstanding line of German pumps and valves now offered in this country. Line includes unique design features, special alloy constructions. Foremost among noteworthy items is glandless process pump. Vanes on back of the impeller keep the shaft seal under partial vacuum during operation. Closed liquid-sealing system prevents passage of air or gas past rotating shaft. When pump is shut down, centrifugal governor actuates seating of ring-type valve

to prevent passage of process fluid into shaftway; as pump is accelerated to full speed governor opens ring valve. In valve line, there are two interesting gate valve designs. One operates with complete freedom from chattering or fluttering of the gate. The other utilizes a flat plate sliding between sealing rings to give complete leakproof and vacuum-tight shut-off for long time intervals on variety of services.—Neumann & Welchman, Fair Lawn, N. J.

**Rotor, Centrifugal**

Removes solids from gases, high efficiency on small particles (248F)

. . . Air or gas-borne solids are removed continuously by Air Centrifuge, a centrifugal rotor, without use of filters, screens, water or electrostatic charges. Operation is continuous and non-plugging even on sticky dust. Unit is effective over wide range of temperature and humidity conditions. It's adaptable to all air flow systems wherever processes use grinders, mixers, blenders, conveyors, extractors, etc.

Compact unit has 42-in. dia., is 7 ft. high. Initial observations on a fertilizer plant installation showed good performance recovering dust 50% by weight less than 10 microns and 20% 3 microns or less. No drop in efficiency appeared at solids loading as high as 75 gr. per cu. ft. according to other test results from dust collecting installations.—The Superior Grain Separator Co., Hopkins, Minn.

**Silencer, Compressor**

For moisture-free air to 200 F. (248G)

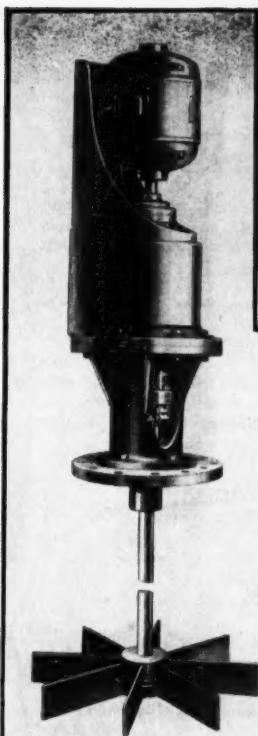
. . . Silencers quiet noise produced by air compressors, blowers, vacuum pumps, and other machines expelling high velocity air to atmosphere. Units are built with straight-through perforated tubes surrounded by a deep layer

of sound-absorbing material. There is a minimum restriction to air flow. Series CA is for pipe sizes up to 6 in., series LCA is for sizes larger than 6 in. pipe diameter.—Burgess-Manning Co., Libertyville, Ill.



# In Mixing and Processing Equipment

## *Look to* **"International"** *for Leadership in* **DESIGN and PERFORMANCE**



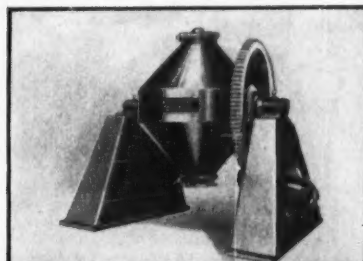
**NEW TYPE MIXER 1 TO 50 H.P.**

*"International"*  
**TOP  
ENTERING  
MIXERS**

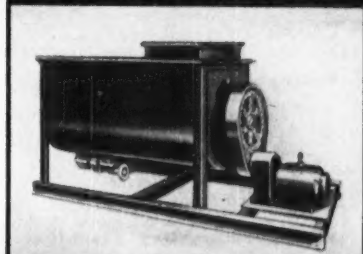


**NEW TYPE 1 TO 100 H.P.**

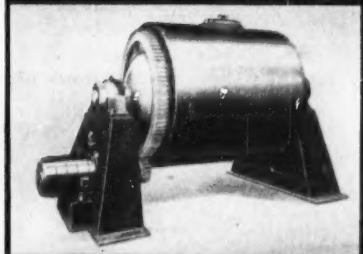
When you're making improvements, building a new plant, or expanding your present facilities, be sure to check with **INTERNATIONAL** for the latest engineering developments in improved equipment for the correct and most economical blending, treating, mixing and grinding—Remember **INTERNATIONAL** manufactures and guarantees the equipment you need in any required sizes and capacities.



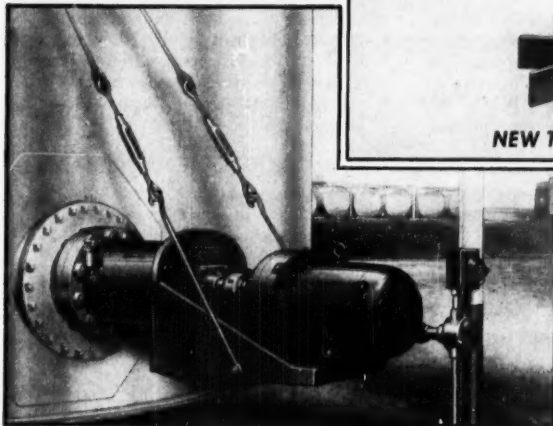
**DRY BLENDERS**  
From 25 to 10,000 lbs.



**RIBBON MIXERS**  
From 1/4 to 175 cu. ft.



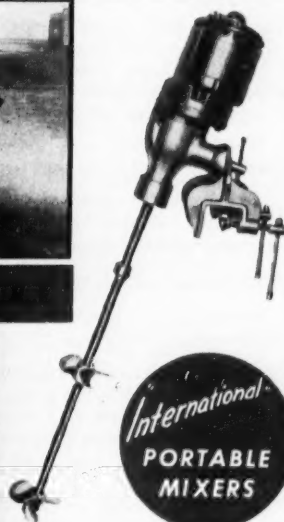
**BALL MILLS**  
Welded Steel Construction



Special Bulletins available on request  
PUT YOUR PROCESSING PROBLEMS UP TO

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*"International"*  
**PORTABLE  
MIXERS**

**NEW TYPE "PF" AND "PS"**  
1/2 TO 5 H.P.

## • Safety Equipment

### Blanket, Fire

Plastic coated, low cost, flexible. (250A)

Vinyl-coated glass-cloth fire blanket is strong and durable. It can be hung ready for use where need is greatest—indoors or out. No covering

needed to protect it from the elements. Blanket measures 60 x 76 in. and weighs 2½ lb.—Standard Safety Equipment Co., Chicago, Ill.

### Board, Bulletin

Flashes safety messages. (250B)

Flashing bulletin board attracts attention to safety posters, messages and photographs. Light from 40-w. lamp flashing at rate of 15 times per

min. shines through posters. Two surfaces at right angles accommodate two posters at once.—Industrial Products Co., Philadelphia 33, Pa.

### Bracket, Extinguisher

Tells weight at glance, safety seal. (250C)

Silent Sentry, combination suspension bracket and weighing device tells you at a glance the condition of your CO<sub>2</sub> fire extinguisher. Calibrated "look slot" visible on each side of red baked-enamel case shows exact condi-

tion of the bottle. Calibration of device to weight of full extinguisher done easily with screwdriver. Safety seal protects against tampering or sabotage.—Am-Tel Equipment Co., Los Angeles 28, Calif.

### Coverall

Lightweight, resists chemical attack. (250D)

Comfort and protection are combined in Feon chemical-resistant coverall. Garment made of Vinyon-N fabric. Color is admiralty gray and material is smooth without being stiff. Fabric not

affected by concentrated mineral acids and alkalis. Temperatures and strong cleaners used by industrial laundries will not affect Vinyon.—Filtration Engineers, Inc., Newark 4, N. J.

### Eductor, Foam

Prevents water backflow. (250E)

Foam eductor for introducing proper mixture of foam liquid into fire hose lines incorporates ball check valve to prevent water flow to foam liquid

container when nozzle is shut off. Several models in 1½ and 2 in. sizes for 3-6% foam.—Rockwood Sprinkler Co., Worcester 5, Mass.

### Extinguisher

Delivers increased flow. (250F)

Fire-fighting effectiveness of line of wheeled extinguishers has been stepped up by different nozzle and gas-tube design and stepped up rate of flow. Models 150-B and 350-B dry chemical extinguishers replace previous

A models. Gas tube design increases dry chemical flow rate by 30%; range is 40 ft. Floating plug seated against rubber pad in nozzle assures water and gas tightness.—Ansul Chemical Co., Marinette, Wis.

### Extinguisher, CO<sub>2</sub>

Low cost, squeeze-type valve. (250G)

Fyre-Freez portable carbon dioxide fire extinguishers feature squeeze-type valve and lower price. Normal hand pressure is sufficient to actuate the extinguisher after safety pin is removed.

For recharge: squeeze valve open to permit entry of recharge gas into cylinder. Extinguishers come in 2½-, 5-, 10-, 20-lb. models.—Walter Kidde & Co., New York 16, N. Y.

### Extinguisher, Dry Chemical

Quick-acting, non-fouling valve. (250H)

Dry-chemical, stored-pressure fire extinguisher has quick-acting, non-fouling valve. Spherical design prevents dry chemical particles from lodging in valve opening. Accidental distortion of valve's mechanism will not interfere with dis-

charging operation. Valve holds pressure so well that extinguisher is effective even after partial discharge. Sizes are 3-, 4-, 5-, 10- and 20-lb. A 30-lb. unit will be available shortly.—Stop Fire Inc., Brooklyn 1, N. Y.

### Extinguisher, Instructions for

Pictorial, on label. (250I)

Foamite and soda-acid 2½-gal. fire extinguishers carry pictorial operating instruction labels. Four action pictures demonstrate sequence of steps to be followed in operating extinguisher cor-

rectly. This eliminates delay or confusion at time of fire and needless loss of fire extinguishing chemical.—American-La France & Foamite Corp., Elmira, N. Y.

### Film Badge, Service for

Interprets gamma radiation exposure (250J)

Film badge service, offered by private company, provides improved personnel protection. Service gives interpretation of gamma radiation from 150 Dev. to 20 Mev. over range of 50 mr. to 50 r. Film packets supplied on weekly or other convenient basis.

Control films to monitor radiation accumulated in transit provided without extra charge with service of three or more badges per week. After development, films returned to user with interpretation and report.—Instruments & Chemical Corp., Chicago 10, Ill.

# LOOK OUT FIRE!



**TWO OF THE GREATEST NAMES IN FIRE PROTECTION  
HAVE JOINED FORCES**

PYRENE and C-O-TWO, world-renowned manufacturers of approved fire protection equipment, are now unified under the same management to give you the finest and most complete line on the market today...

- ★ built-in fire detecting systems that quickly respond to smoke, heat or flame...
- ★ all types of portable fire extinguishers and built-in fire extinguishing systems that kill fire fast...
- ★ plus an expert fire protection engineering service that gives you unbiased advice on what is best for your particular fire hazards.

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portable fire extinguishers... built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM



## SAFETY EQUIPMENT . . .

**Fountain, Goggle Cleaning**

Operates easily with foot treadle. (252A)

. . . Low-cost, goggle-cleaning fountain permits workers quickly and easily to clean goggles, safety glasses, plastic face shields. HAWS Model #8985, fur-

nishes aerated spray directly down on surface being cleaned. Fountain operated by foot treadle.—Haws Drinking Faucet Co., Berkeley 10, Calif.

**Glasses, Safety**

Fit most people, easy lens replacement. (252B)

. . . Model 80 split-joint spectacle is adjustable to fit 90% of all faces. Double bridge design more than doubles frame strength. Temples are plastic throughout. Ball-chain ear hook fits

comfortably behind ear. Removal of temple hinge screw and frame clip permits split joint to spread, allowing lens removal.—Watchmocket Optical Co., Providence 3, R. I.

**Goggle, Chemical**

Has natural draft ventilation. (252C)

. . . Stac-Vent chemical safety goggle protects completely against chemical splashing and impact and is free from fogging. Warm, moist air is removed from the goggle by a natural draft through a protected vent at the top of

the goggle. Soft vinyl frame yields to the facial contours. Positive lock bar holds in place the replaceable lenses of optically-correct, shatter-proof plastic.—Watchmocket Optical Co., Providence, R. I.

**Kit, Burn First Aid**

Aerosol dispensers, accessories. (252D)

. . . First aid kits for burns are fitted with aerosol dispensers for applying soothing and protective solutions. Dispensers contain 4 oz. of solution which is sufficient to treat the most extensive

burns. Also included are bandages, compresses and scissors. Kit has dirt and moisture-proof construction of 20 gage steel.—Medical Supply Co., Rockford, Ill.

**Kit, First Aid**

Quick and easy to use. (252E)

. . . Simplified fully-illustrated instructions and easily accessible contents give first aid kit maximum utility. When lid of kit is opened, unit packages inside extend above base for quick removal.

Included in kit are visual swabs (gauze—rather than cotton-tipped), antiseptics, ammonia inhalant vials, compress bandages.—Mine Safety Appliances Co., Pittsburgh 8, Pa.

**Lens, Plastic Safety**

Hard surface resists scratching. (252F)

. . . Optilite A safety lens has an extremely hard surface, superior scratch resistance and long life. Lens weighs half as much as safety glass. An alternate plastic formula, Optilite B, meets low cost needs. It's recommended for

operations where lens life is short. Lenses will fit any standard industrial spectacle frame, will meet federal specifications for impact and optical quality.—U. S. Safety Service Co., Kansas City 6, Mo.

**Mask, Oxygen Safety**

Fits into coat pocket, low cost. (252G)

. . . Self-contained, 30 min. breathing apparatus is called Pocketaire. Weighing only 8½ lb. complete, it features a 5 min. escape cylinder which can be opened when the large cylinder is

exhausted. Used with oxygen, it can be recharged from any standard oxygen cylinder. Cost is low without compromising material or workmanship.—Cycle-Flo, Milford, Conn.

**Nozzle, Fog**

Atomizes better at lower pressures. (252H)

. . . Fog nozzle for hose gives better reach and coverage and better atomization at lower pressures. Two models, G10 and G15, are offered for two different capacity ranges. Both nozzles

are self-cleaning and non-clogging; can produce either fog or a straight stream. Fog capacities are 25 and 50 gpm. respectively.—Bete Fog Nozzle, Inc., Greenfield, Mass.

**Nozzle, Industrial Fog**

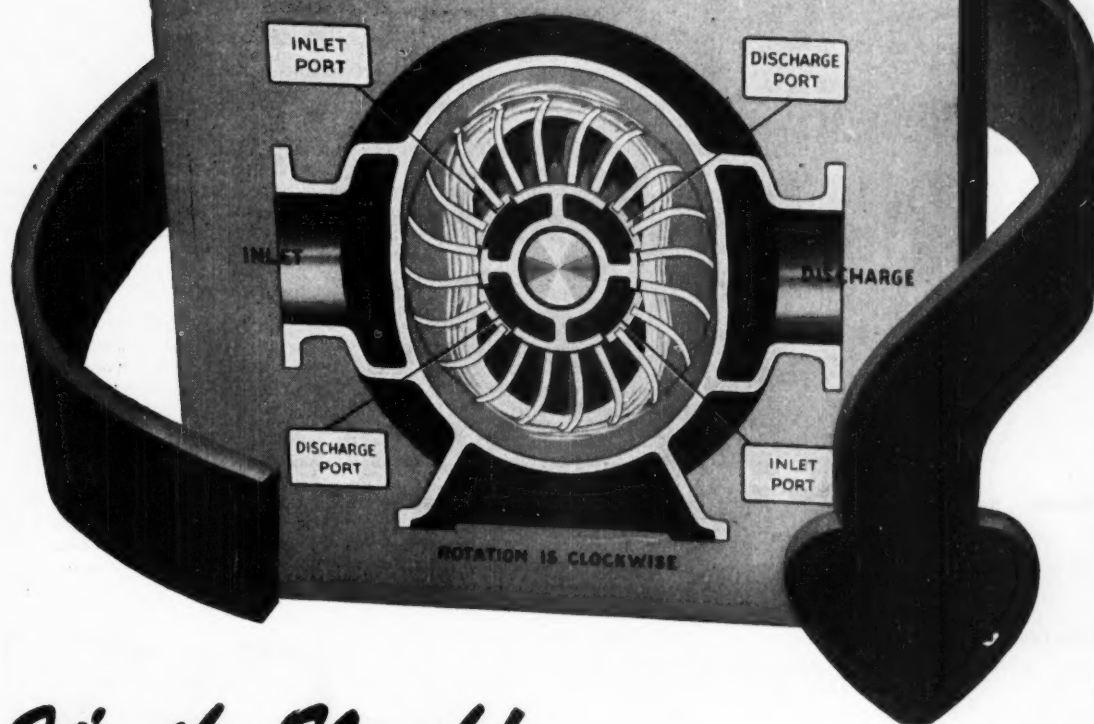
Low-cost, opens 160 deg. (252I)

. . . Industrial fog nozzle, Akr-O-Mist, has low initial cost, is similar to municipal fire-department nozzles. Recommended for use with all industrial hose and hose racks, nozzle opens immediately from shut-off position to 160 deg. full fog position. Double shut-off stops flow by turning nozzle either to extreme right or left. Vapor from nozzle prevents the extensive water damage caused by heavy, solid stream of water. Smothers fires quickly, prevents flash back and provides protective screen that shields fire fighter.—Akron Brass Mfg. Co., Wooster, Ohio.





## This is Why the Nash is the Most Simple Compressor



## *It's the Nash!*

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

**NASH ENGINEERING COMPANY**  
313 WILSON, SO. NORWALK, CONN.

## SAFETY EQUIPMENT . . .

### Proportioner, Foam

Gives three-way protection, low cost. (254A)

. . . Inexpensive foam proportioner permits delivery of water, wet water or foam with turn of a valve. Either a thick blanket of foam can be generated or wet water can be supplied where

quick, deep penetration is desired. At same time where ordinary fire is being fought plain water can be delivered.—National Foam System, Inc., West Chester, Pa.

### Pump, Fire-Fighting

Driven by gas turbine, throws 200 ft. (254B)

. . . Portable fire-fighting pump, driven by small gas turbine, delivers 500 gpm. at 100 psi. with 16-ft. suction lift. Pump has connection for 4 in. suction

line and 2 connections for 2½ in. discharge hoses. Gas turbine develops approximately 50 hp.—Solar Aircraft Co., San Diego 12, Calif.

### Respirator

Built for long life, light-weight face piece. (254C)

. . . Gasfoe respirator, having all parts independently replaceable, assures long service life. Light-weight, compact face piece is easily shaped by hand to fit face contour. This feature, together with soft sponge-rubber face-piece cushion,

assures excellent face seal without pressure discomfort. Replaceable plastic cartridge is factory packed to prevent crushing or channeling of charcoal filling.—Mine Safety Appliance Co., Pittsburgh 8, Pa.

### Respirator

For both toxic dusts and organic vapors. (254D)

. . . Single respirator protects wearer against both toxic dusts and organic vapors. It employs static-web dust filters clamped on the respirator's twin chemical cartridge filters. Dust filters are made of charged resin-treated felt

that retains dust both by electrostatic action and mechanical filtration. Cartridges and filters are independently replaceable, allowing greater economy.—Mine Safety Appliances Co., Pittsburgh 8, Pa.

### Rubber, Safety

Sure footed, holds on slippery surfaces (254E)

. . . Safety rubber, already in use by plane handlers on aircraft carriers, is available industrially. Squeegee action of concentric suction cups prevents

slipping. Neoprene construction gives long life in presence of oil, grease, acid, solvents.—Tingley Rubber Corp., Rahway, N. J.

### Shields, Eye

Attach to safety glasses, protect sides. (254F)

. . . Removable side shields can be used with safety spectacles of any size and shape. They extend the range of protection to the top, side and bottom sectors. Positive, nickel-silver clip holders make for easy attachment or removal of the shield. If prescription safety spectacles are worn then the shields can be removed at the end of the day and replaced again in the morning.—Watchmocket Optical Co., Providence, R. I.



### Sprinkler, Spray Type

Directs water away from ceiling. (254G)

. . . Spray sprinkler effectively extinguishes fire and prevents its spread. Unlike standard sprinkler deflectors that put about half the water on the ceiling, these spray deflectors use water more efficiently. About twice as much spray is placed on fire location. Dissipation

of heat is rapid, helping to prevent ceiling and other materials near fire being raised to combustion temperature. Sprinkler approved by Factory Mutual Labs and Underwriters Laboratories, Inc.—Grinnell Co., Inc., Providence, R. I.

### Tower, Portable Foam

Operates hydraulically, saves time and manpower. (254H)

. . . Portable foam tower, used in fighting flammable-liquid tank fire, is raised and lowered by hydraulic action. Tower can be set up with one-third the manpower in a fraction of the time formerly needed. After positioning

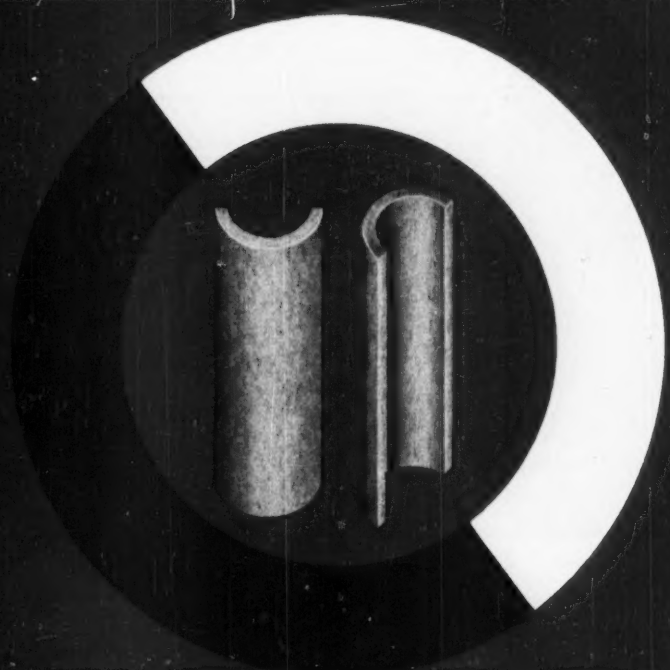
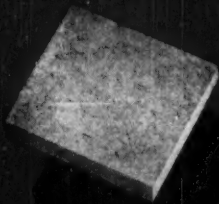
at the base of a tank and connecting hose, unit can be controlled at safe distance from burning area. Actuation of hydraulic system raises tower to full height within seconds.—National Foam System, Inc., West Chester, Pa.

### Trailer, Auxiliary

Supplements fire truck, carries extra equipment. (254I)

. . . Trailer acts as auxiliary to large fire truck. It carries essential fire-fighting equipment for which there's no room on the large truck. Double-opening doors across full width of trailer provide access to front and rear

storage compartments. A center well fitted with top-opening door serves as storage space for gas masks. In addition to the towing attachment the trailer has pull handles for manual movement.—Preakness Inc., Newark, N. J.



# UNIBESTOS



## FOR YOUR MOST EXACTING INSULATION REQUIREMENTS

- ◆ Tough. Will not crack, crumble or powder
- ◆ Withstands impact from bumps, abrasion
- ◆ Designed for temperatures up to 1200°
- ◆ Unaffected by water, vapor, chemical fumes
- ◆ Economical - low maintenance cost
- ◆ Requires single layer application
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*write for, literature booklet*



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# Inventory of Technical Literature

... An organized checklist, the most comprehensive available, of literature now available from manufacturers.

## Chemicals

**Absorbers, Ultraviolet Radiation.....** Ultraviolet radiation causes deterioration of many natural and synthetic materials. Uvinuls are designed to absorb radiations and minimize such damage.  
256A Antara Chem.

**Accelerators, Delayed Action.....** Covers chemical & physical properties of Nobs Special accelerator & Nobs No. 1 accelerator. Graphs illustrate outstanding delayed action. 39 p. Technical Bulletin 836.  
256B American Cyanamid Co.

**Acetonitrile.....** 8 p. on versatile material covers properties, constant-boiling mixtures, solubility for diverse materials, uses, suggested applications, & bibliography. Includes charts. Technical Bulletin F-7501.  
256C Carbide & Carbon Chem. Co.

**Acetyl Chloride, Technical.....** Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-30151.  
259b Baker & Adamson.

**Acetylene.....** High purity acetylene "on tap." Can supply pipeline acetylene at purity of 99.5% or better. Features many cost-saving advantages. Data in "The Chemical Century Comes to Calvert City."  
350D National Carbide Co.

**Acid, Adipic.....** A versatile dibasic acid with many applications in plastics, petroleum, chemical & allied fields. Descriptive literature covers specifications, chemical & physical properties, suggested uses, etc.  
256E E. I. du Pont de Nemours

**Acid, Alkanesulfonic.....** Valuable information on alkanesulfonic acid... an unusually effective catalyst where degradation of sensitive organic reactants must be avoided. Non sulfonating, non-oxidizing. Bulletin 11.  
256F Indoil Chem. Co.

**Acid Anhydrous, Hydrofluoric.....** 40 p. book offered by company contains valuable information on hydrofluoric acid anhydrous. Provides useful data for those who now use HF, or for those contemplating its use.  
256G Harshaw Chem. Co.

**Acid, Azelaic.....** Economic replacement for high-priced dibasic acids has unlimited potential use in plasticizers, alkyl resins, polyesters, polyamides & synthetic lubricants. Covers typical characteristics & composition.  
256H Emery Industries.

**Acid, Barbituric.....** Catalog includes data on properties (molecular weight, melting point, solubility) as well as specifications (color, purity, etc.) & typical reactions. Available in Technical Bulletin.  
256I Kay-Fries Chem.

**Acid, Dichloroacetic.....** Technical data on dichloroacetic acid and dichloroacetyl chloride. Specifications, properties, application and resume of past experimental work. Potentialities in manufacture of pharmaceuticals.  
256J Kay-Fries Chem.

**Acid, Diglycolic.....** Economical dibasic acid offers interesting possibilities in numerous industrial applications. White crystalline solid with 97.5% min free acid. Specifications, properties, suggested uses available.  
256K E. I. du Pont de Nemours

**Acid Esters.....** Preliminary literature summary gives description of the chemical properties, recommended uses & representative reactions of acetonedicarboxylic acid esters. Details in literature offered.  
256L Smith-N. Y. Co.

**Acid, Folic.....** Provides complete information on folic acid of such purity & uniformity that it can be used for either oral or parenteral preparations. Specifications & tests, applications, etc. 36 p.  
256M N. Y. Quinine & Chem. Wks.

**Acid, Fumaric.....** Outlines typical reactions which indicate the chemistry of fumaric acid and the nature of some of its reaction products. Also offers complete details in Bulletins C-102 and O-115.  
256N Monsanto Chem. Co.

**Acid, Fumaric.....** Fumaric completely covers use of fumaric acid in resins for use in molding, casting, laminating & surface coating compounds as well as food & pharmaceutical uses. Bulletin 46.  
256O Charles Pfizer & Co.

**Acid, Oxalic, Anhydrous.....** Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-31341.  
259d Baker & Adamson.



## What It Contains . . .

This is CE's first annual inventory of important new equipment and accessories developed or announced during the second six months of 1953 and the first six months of 1954. It covers 571 new or newsworthy equipment developments carefully screened by CE editors for publication in the Process Equipment News department which appears every month in Chemical Engineering. It includes only those developments of major significance or prime interest to chemical engineers in the chemical process industries. It stresses equipment and accessories available for use in commercial or large-scale processing and production work.

## For More Information...

For more information on any item listed in this section, simply write its code number on one of the Reader Service postcards beginning on p. 35, then mail to us. Information comes to you direct, and promptly, from the manufacturer. Or you can write directly to the manufacturer, referring to this Inventory Issue, at the address given with each item. You can also refer to past issues of Chemical Engineering for more details by using the annual index in December issues or the monthly index in the Process Equipment News department. Note that all equipment has been listed in one of 13 categories for your convenience.

**Acid, Peracetic.** . . . . Presents new bulletin describing how Becco peracetic acid 40% can be used in a very simple and satisfactory procedure for bleaching Nylon Type 670. Complete details in Bulletin 60.  
257A Buffalo Electro-Chem. Co.

**Acid, Phenylmercaptocetic.** . . . . Provides valuable information on phenylmercaptocetic acid—includes formula, physical properties, specifications, various uses, price schedules, bibliography, etc. Data sheet available.  
257B Evans Chemetics.

**Acid, Salicylic.** . . . . Major producer of salicylic acid and salicylates assures the quality, quantity and form required. Shipped in fiber drums, 25 to 250 pounds net. All grades available. Complete technical information.  
257C Heyden Chem. Corp.

**Acid, Stearic.** . . . . Booklet describes how the outstanding stability of double pressed-type stearic acid can help keep end products fresh longer and increase sales appeal at the point-of-sale. Illustrated.  
257D Armour Chem. Div.

**Acids, Fatty.** . . . . Covers typical composition and specifications for Hydrofrol fatty acids. Hydrofrol glycerides, Adol fatty alcohols and sperm oil products. This and other details in Bulletin No. 966.  
257E Archer-Daniels-Midland Co.

**Acids, Fatty.** . . . . Features development of a group of unsaturated fatty acids which assure long life and continuing brilliance for white alkyd enamels. Data available in Technical Bulletin No. A-8.  
257F Armour Chem. Div.

**Acids, Fatty.** . . . . Data on new structurally modified fatty acids. Includes characteristics, properties, effects of their unconventional behavior in finished products. Bulletin 50. "Emery Modified Fatty Acids."  
257G Emery Industries

**Acids, Fatty, Coconut.** . . . . Ideally suited for shampoos and other products that require pleasant, soothing contact with the skin—does not contain irritating low molecular weight fatty acids. Coco Booklet.  
257H Armour Chem. Div.

**Acids, Fatty, Coconut.** . . . . How you can save money by eliminating costly formulation changes made necessary by coconut fatty acids of poor quality. Complete data in Catalog, "Fatty Acids in Modern Industry."  
257I A. Gross & Co.

**Acids, Fatty, Distilled.** . . . . Ideal for lubricating greases as well as hand cleaners, soaps, etc. Wall chart gives composition & specifications of 40 ADM chemicals from oils & fats. Light in color, free of moisture, etc.  
257J Archer-Daniels-Midland

**Acids, Organic.** . . . . 32 p. covers data on 8 organic acids sold in commercial quantities. Provides information on uses in many industries, physical properties, specifications, etc. Booklet F-4768.  
257K Carbide & Carbon Chem. Co.

**Acids, Organic.** . . . . Offers a new, 17 p. Technical Bulletin on the uses of citric, gluconic, tartaric and oxalic acids and their salts in the cleaning, polishing and plating of metals. Includes bibliography.  
257L Chas. Pfizer & Co.

**Acrylamide.** . . . . 159 p. New Product Bulletin offers data on acrylamide; 3-aminopropanol; N-terbutylacrylamide; N,N-diallylmelamine; triallyl cyanurate; N,N-methylenebisacrylamide; guanamines; etc.  
257M American Cyanamid Co.

**Acrylonitrile.** . . . . Highly stable bifunctional chemical finding increasing use as reactive intermediate. Literature includes abstracts which show facets of current research with this versatile chemical.  
257N American Cyanamid Co.

**Additives, Paint.** . . . . Company makes available a valuable file folder and ten bulletins describing many and varied case histories of Nuosperse 657, an improved wetting, dispersing and anti-settling agent.  
257O Nuodex Products Co.

**Adhesives.** . . . . Manufacturers offer new, valuable illustrated reference, "Adhesives for Mylar," which covers a full range of adhesives for use with Mylar polyester film. Leaflet No. 130 gives full details.  
257P Rubber and Asbestos Corp.

**Adhesives, Pressure Sensitive.** . . . . Solvent solutions of newly developed silicone materials not strictly adhesives because materials form no hard, brittle bond. Advantages, use, properties, etc. In Data Sheet 4-602.  
257Q Dow Corning Corp.

**Alcohol, Acetylenic.** . . . . Alcohols, covering wide range of volatility, available in drum quantities. Technical Bulletin covers methyl butynol, methyl pentynol, dimethyl hexynol, ethynyl cyclohexanol, etc.  
257R Air Reduction Chem. Co.

**Alcohol, Ethyl.** . . . . Covers description, specifications, physical properties, grades & types, toxicity, government regulations, shipping, handling & storage, shipping containers, etc. TDS No. 21 available.  
257S Commercial Solvents Corp.

**Alcohol, Furfuryl.** . . . . Derived from agricultural residues & useful in manufacture of wide variety of products which include resinous mortars, cements, binder resins, textiles, etc. Bulletin No. 205.  
257T Quaker Oats Co.

**Alcohol, Myristyl.** . . . . Company makes available literature upon request (new Technical Bulletin) which contains pertinent information on the uses and specifications of company line of myristyl alcohol.  
257U Aceto Chem. Co.

**Alcohol, Polyvinyl.** . . . . Dependable source of supply for use in adhesives, sizes, coatings. Also offer many features: non-gelling; free-flowing; fast-dissolving; uniform; etc. Fully described in PVB No. 45A.  
257V Colton Chem. Co.

**Alcohols.** . . . . 52 p. includes valuable data on 20 alcohols sold in commercial quantities. Covers uses & suggested applications, properties, shipping, test methods, etc. Photographs and charts. Book F-4731.  
257W Carbide & Carbon Chem. Co.

**Alcohols, Fatty.** . . . . Description of alcohols vacuum-distilled by techniques that have been improved over period of 25 years. Booklet on "Possibilities" tells uses as intermediates, additives, emulsifiers, etc.  
257X M. Michel & Co.

**Alcohols, Fatty.** . . . . Covers chemical structure & composition, reactions, applications, as well as solubility data on complete company line of fatty alcohols. Company offers Technical Bulletin No. 903-A.  
257Y Archer-Daniels-Midland Co.

**Alcohols, Fatty.** . . . . Makes available Cachalot fatty alcohol data sheet. This newly-revised data sheet shows typical analyses for 15 types of Cachalot brand fatty alcohols and their use in chemical synthesis.  
257Z M. Michel & Co.

**Alcohols, Fatty.** . . . . New Fact Sheet, "Fatty Alcohols for Industry," available on request, presenting typical reactions, may suggest the way you can use these versatile alcohols in your processing. Technical data.  
257AA Ethyl Corp.

**Aldehydes.**.....Describes aldehydes sold in commercial amounts as well as those available in research quantities in 36 p. Uses, applications, properties, specifications, etc. also described in Book F-5278.  
255A Carbide & Carbon Chem. Co.

**Algicides.**.....Description of process in which pool algicide fights & conquers unpleasant, unsanitary microscopic plants. Available in liquid & jelly forms. Data on system to maintain clear swimming pools.  
255B Intertol Co.

**Alubragum.**.....Technical information in brochure. Describes the Alubragums (sodium and potassium polyacrylates) and their applications as specialized latex thickeners for the latex and paint industry.  
255C W. H. & F. Jordan, Jr.

**Alumina, Activated.**.....Advantages of activated alumina for hydrogen fluoride alkylation: elimination of silica migration; better fluoride removal; dries alkylate while in process. Detailed Brochure offered.  
255D Reynolds Metals Co.

**Alumina, Activated.**.....Manufacturer releases literature—illustrated, 48 p. covering data on grades, comparative desiccating properties, physical characteristics, applications, adsorptive efficiency, etc.  
255E Aluminum Co. of America

**Aluminum Chloride, Anhydrous.**.....Describes four sizes for almost every processing need: fine grind; extra fine grind; coarse grind; coarse screened. Offers Data Sheet. Bulletin 100 covers products & services.  
255F Hooker Electrochem. Co.

**Aluminum Fluoride, Powder, Technical.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-32521.  
255G Baker & Adamson.

**Amines, Polyethoxy.**.....Describes reaction products of Primene JM-T with ethylene oxide. Properties suggest uses in fields of surface-active agents & corrosion inhibitors. Bulletin No. SP-127 available.  
255G Rohm & Haas Co.

**Aminoalcohol Compounds.**.....Used in preparation of self-polishing floor waxes, cosmetic creams, textile specialties, cleaning compounds, & other types of wax, resin & oil emulsions. Booklet gives physical properties.  
255H Commercial Solvents Corp.

**Ammonia, Anhydrous.**.....Fully covers specifications, physical properties, numerous uses, as well as shipping, handling & storage, toxicity, first aid, etc. in Technical Data Sheet 22. Various charts included.  
255I Commercial Solvents Corp.

**Ammonia, Cylinder.**.....Company presents valuable handbook, "Guide to Use of Barrett Brand Cylinder Ammonia." Shows most economical usage; as well as containing chemical properties, handling, charts, etc.  
255J Allied Chem. & Dye Corp.

**Ammonia Leak Detector Kits.**.....Now offered upon request by manufacturer, a useful ammonia leak detector kit. These handy kits are conveniently pocket size, and can be put to use over and over again.  
255K Allied Chem. & Dye Corp.

**Ammonium Sulfate, Purified.**.....Announces the availability of an informative Data Sheet which covers pertinent details concerning physical & chemical properties, suggested uses, containers, etc. No. DA-33151.  
255N Baker & Adamson.

**Antioxidants, Food-Grade.**.....New bulletin, "Key to Feed Markets for Animal Fats," available specifically for use by renderers & feed manufacturers. Offers complete details and information on antioxidants.  
255L Eastman Chem. Products

**Aromatics, Coal Tar.**.....Used extensively in the paint and varnish industry where good solvency & controlled evaporation rate are required. Company furnishes complete specifications and samples.  
255M Pennsylvania Industrial

**Bacteriostat.**.....For hand cleanliness. Use in hand soaps reduces resident skin flora. Clings to skin. Keeps hands virtually germ-free long after washing & reduces resident skin bacteria up to 97%. Technical Bulletin.  
255N Monsanto Chem. Co.

**Barium Fluoride, Technical.**.....Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-34181.  
255Q Baker & Adamson.

**Barrel Finishing, Precision.**.....Information on compounds for descaling, deburring, abrasive & non-abrasive cut-down, finishing, coloring, etc. Industrial purposes, characteristics, uses, advantages, field data. 32 p.  
255R Lord Chemical Corp.

**Benthal.**.....Product is used in production of short & medium oil alkylid resins to control viscosity. Also acts as molecular chain stopper. Improves resin durability, alkali & water resistance & film gloss.  
255P Monsanto Chem. Co.

**Benzene Alkyl.**.....Description of procedures for getting a variety of surface active end products from sulfonation of alkyl benzene. Also includes analytical procedures for general property tests. Bulletin P-148.  
255Q Monsanto Chem. Co.

**Benzol.**.....Technical Bulletin 109-53, "Benzol Toluol Xylol," contains numerous photographs and descriptions of Texas plant & offers specifications on company line of aromatics. Available on request.  
255R Caden Petroleum Corp.

**Benzophenone.**.....Use in perfumes well known... but potential in synthesis may still be exploited. Suggested as intermediate for certain antihistaminics, hypnotics, etc. Additional information provided.  
255S American-British Chem.

**Betaine Hydrochloride.**.....Technical Data Sheet offers essential information, gives description of suggested uses, formula, composition, melting point, appearance, solubility & grades available.  
255T Chemo Puro Mfg. Corp.

**Biochemicals.**.....Invaluable information on over 600 varied products for research in fields of biology, microbiology, bacteriology, biochemistry & nutrition. In new GBI Reference Catalogue. Available on request.  
255U General Biochemicals

**Bleaching & Germicidal Preparations.**.....Product used as mild bleaching agent & as safe, effective, nonirritating germicide. Booklet covers properties, compatibility, formulation & processing, etc. Bulletin O-101.  
255V Monsanto Chem. Co.

**Brighteners, Optical.**.....Catalog describes new optical brighteners—Safaritone White WNO & Safaritone White C. Includes pertinent data on features, & application—in addition to samples—of each. 14 p. Booklet.  
255W Hilton-Davis Chem. Co.

**N-Bromosuccinimide.**.....Data sheet presents information on physical properties, reactions and uses, storage and handling, packaging, availability. In addition to a complete bibliography. Catalog No. 930.  
255X Arapahoe Chem.

**Bromantins.**.....Contains pertinent data on dibromantins (Catalogue No. 932) and monobromantins (Catalogue No. 931)—properties, uses, storage and handling, packaging, availability and references—in Technical Bulletin.  
255Y Arapahoe Chem.

**Calcium Acrylate.**.....Describes monomeric, water-soluble salt which will polymerize in presence of catalyst to a water-insoluble & rubber-like gel. Applications involving a water-insoluble binder. Bulletin SP-42.  
255Z Rohm & Haas Co.

**Calcium Carbonates, Precipitated.**.....Valuable as premium extender & additive in paint manufacture. In printing inks, less abrasive than similar materials. General properties. Technical Service Report P-18.  
255AA Witco Chem. Co.

**Calcium Chloride.**.....Presents detailed 40 p. manual, offered to concrete users so they will have ready reference to quantitative data on the effects of calcium chloride in concrete. Completely illustrated.  
255BB Calcium Chloride Institute

**Calcium Chloride.**.....Tables, graphs, applications in 64 p. Data on properties, use, & control of straight calcium chloride as brine medium in refrigeration & ice manufacturing systems. Bulletin 4.  
255CC Solvay Process Div.

**Calcium Hydride.**.....Supplies important data on physical properties, chemical properties and applications, handling and storage, available forms and references on company line of calcium hydride. Bulletin 201-D.  
255DD Metal Hydrides

**Calcium Phosphide, Technical.**.....Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-35341.  
255V Baker & Adamson.

**Carbon.**.....Features high purity. An ideal carbon raiser, heat producer, reducing agent. It is highly reactive, & has high resistivity. Low priced & available in large quantities. 14 p. Booklet.  
255EE Portland Gas & Coke Co.

**Carbon, Activated.**.....Description of how industry saved \$150 million annually through the use of activated carbon in recovering solvent vapors. Recovery is both efficient & economical. Form No. 6658.  
255FF Carbide & Carbon Chem.

**Carbon, Activated, Granular.**.....Available to help cut carbon costs and increase efficiency of your process. Initial cost is considerably lower than similar materials. Offers detailed literature.  
255GG Pittsburgh Coke & Chem. Co.

**Carbon Dosage.**.....Darcograph solves carbon dosage problems. A graphical calculating device that saves much time in determining minimum dosages. Mathematically correct, simple to use, easy to understand.  
255HH Darco Dept.

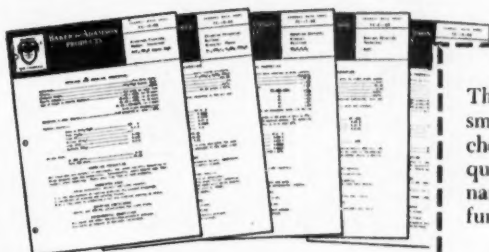
**Carbon & Graphite.**.....Applied to products ranging from battery & welding carbons to tube anodes, seal rings, bearing materials, electrical contacts, rail bonding molds. 44 p. Carbon Specialties Catalogue 40A.  
255II Stackpole Carbon Co.

**Carriers, Catalyst.**.....Alundum carriers prove highly successful in reactions such as those involved in manufacture of phthalic anhydride, maleic anhydride & oxidation of ethylene. Bulletin No. 7.  
255JJ Norton Co.

**Catalysts.**.....Manufactures to specifications dozens of catalysts for many different & complex manufacturing processes—hydroforming, alkylation, dehydrogenation, cyclization, isomerization, oxidation, etc.  
255KK Harshaw Chem. Co.

**Catalysts.**.....Company of leading manufacturers of catalysts, absorbents, desiccants & other chemically treated materials offers informative booklet describing chemical applications of many company products.  
255LL Filtrol Corp.

# For Production and Research Men who use High Purity Process Chemicals . . .

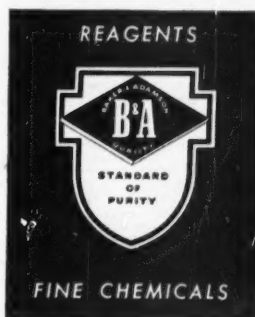


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To Help You make preliminary evaluation of these important new process chemicals, General Chemical has prepared a special data sheet for each. These sheets cover pertinent physical and chemical properties, suggested uses, containers, etc. Since many of these fine chemicals are relatively new to the industrial scene, data on them are frequently not available in standard references, thus you will find these particular B&A data sheets of more than ordinary value.

To Obtain Data sheets on the B&A Fine Chemicals that interest you, just check the items, cut out the list and mail it with your business letter head.



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The following fine chemicals represent a small cross section of the many high purity chemicals bearing the "B&A" shield of quality. Please put check in box before name of each product on which you want further information.

Product	Data Sheet No.
<input type="checkbox"/> Acetamide, Crystal, Technical	DA-30081
<input type="checkbox"/> Acetyl Chloride, Technical	DA-30151
<input type="checkbox"/> Acid Molybdic, 85% Purified	DA-31181
<input type="checkbox"/> Acid Oxalic, Anhydrous	DA-31341
<input type="checkbox"/> Aluminum Chloride, 32° Baume Solution	DA-83851
<input type="checkbox"/> Aluminum Fluoride, Powder, Technical	DA-32521
<input type="checkbox"/> Aluminum Nitrate, Crystal, Technical	DA-32341
<input type="checkbox"/> Aluminum Sulfate, Hexahydrate, Technical	DA-48871
<input type="checkbox"/> Ammonium Acetate, Crystal, Purified	DA-32711
<input type="checkbox"/> Ammonium Fluoborate, Crystal, Technical	DA-32731
<input type="checkbox"/> Ammonium Fluoride, Crystal, Technical	DA-32671
<input type="checkbox"/> Ammonium Oxalate, Granular, Purified	DA-33251
<input type="checkbox"/> Ammonium Persulfate, Crystal, 98% Purified	DA-33091
<input type="checkbox"/> Ammonium Sulfate, Purified	DA-33151
<input type="checkbox"/> Ammonium Sulfite, Crystal, Purified	DA-33231
<input type="checkbox"/> Ammonium Thiosulfate, Solution, Technical	DA-85271
<input type="checkbox"/> Barium Fluoride, Technical	DA-34181
<input type="checkbox"/> Calcium Acetate, Powder, Purified	DA-34991
<input type="checkbox"/> Calcium Chloride, U.S.P.	DA-35011
<input type="checkbox"/> Calcium Chloride, Anhydrous, Purified	DA-49211
<input type="checkbox"/> Calcium Fluoride, Powder, Reagent	DA-35201
<input type="checkbox"/> Calcium Phosphide, Technical	DA-35341
<input type="checkbox"/> Chromium Fluoride, Technical	DA-35771
<input type="checkbox"/> Chromium Nitrate, Crystal, Purified	DA-35801
<input type="checkbox"/> Chromium Nitrate, Solution, Technical	DA-49711
<input type="checkbox"/> Chromium Potassium Fluoride, Purified	DA-35791
<input type="checkbox"/> Chromium Potassium Sulfate, Granular, Photo	DA-35841
<input type="checkbox"/> Cupric Acetate, Crystal, Technical	DA-36271
<input type="checkbox"/> Cupric Fluoride, Technical	DA-36481
<input type="checkbox"/> Cupric Nitrate, Crystal, Purified	DA-36412
<input type="checkbox"/> Cupric Nitrate, Solution, Technical	DA-49701
<input type="checkbox"/> Cuprous Chloride, Technical	DA-36571
<input type="checkbox"/> Ferric Nitrate, Crystal, Technical	DA-37441
<input type="checkbox"/> Ferrous Ammonium Sulfate, Crystal, Technical	DA-37571
<input type="checkbox"/> Ferrous Sulfate, Exsiccated, U.S.P.	DA-37671
<input type="checkbox"/> Hydrofluoric Acid, 48% (C.P.) A.C.S.	DA-49791
<input type="checkbox"/> Lead Nitrate, Crystal, Technical	DA-38381
<input type="checkbox"/> Magnesium Fluoride, Purified	DA-39121
<input type="checkbox"/> Magnesium Nitrate, Crystal, Technical	DA-39131
<input type="checkbox"/> Nickelous Nitrate, Crystal, Purified	DA-40271
<input type="checkbox"/> Oxamide, Purified	DA-48651
<input type="checkbox"/> Potassium Acetate, N.F., Crystal, Technical	DA-40821
<input type="checkbox"/> Potassium Bifluoride, Technical	DA-41461
<input type="checkbox"/> Potassium Borate, Tetra, Purified	DA-40771
<input type="checkbox"/> Potassium Cyanate, Powder, Purified	DA-41591
<input type="checkbox"/> Potassium Cyanate, Powder, Technical	DA-48821
<input type="checkbox"/> Potassium Fluoride, Anhydrous, Purified	DA-40911
<input type="checkbox"/> Potassium Fluoride, Crystal, Purified	DA-41041
<input type="checkbox"/> Potassium Fluoborate, Crystal, Technical	DA-41361
<input type="checkbox"/> Potassium Nitrite, Fused, Lump	DA-85521
<input type="checkbox"/> Potassium Thiosulfate, Purified	DA-41521
<input type="checkbox"/> Potassium Titanium Fluoride	DA-40722
<input type="checkbox"/> Sodium Fluoborate, Crystal, Technical	DA-42401
<input type="checkbox"/> Stannous Chloride, Crystal, Technical	DA-43421
<input type="checkbox"/> Zinc Formate, Crystal, Purified	DA-44441

CUT OUT THIS COUPON AND MAIL



**Catalysts**.....Data on catalysts for producing synthesis gases & hydrogen; for hydrogenation; for selective removal of acetylene; for desulfurization; for oxygen removal. Illustrated catalogue.  
260A Girdler Corp.

**Catalysts, Rhodium**.....Designed to simplify catalytic processing & effect savings for chemical & pharmaceutical manufacturers. Covers notes on their uses & a list of their most available forms. "Platinum Metals Catalysts."  
260B Baker & Co.

**Catalysts, Rhodium**....."Rhodium Catalysts for the Hydrogenation of Ring Compounds" covers hydrogenation of the benzene ring...the alkyl substituted ring...the hydroxyl substituted ring...etc.  
260C Baker & Co.

**Cellulose Acetate**.....31 p. basic technical booklet of tables, graphs, drawings. Includes complete data on properties. Various uses listed. Late information on plasticizers & solvents for cellulose acetate.  
260D Hercules Powder Co.

**Cellulose Gum**.....Company releases new technical booklet especially designed for the paper industry, describing the numerous advantages of using Hercules CMC for gloss ink printing. Graphs, tables, etc.  
260E Hercules Powder Co.

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260F Versene, Inc.

**Chemicals**.....103 p. covers data on uses, product quality, & shipping for alkalis, chlorides, solvents phosphates, barium products, magnesia products, agricultural products, etc. Illustrated Charts and Tables.  
260G Westvaco Chem. Div.

**Chemicals**.....44 p. includes specifications & properties of high-quality chemicals for agricultural & industrial uses. Covers ammonia, ammonium nitrate, methanol, etc. Illustrated booklet available.  
260H Spencer Chem. Co.

**Chemicals, Chromium**.....Serves wide range of industries—pigment manufacturing, leather tanning, electroplating, metal cleaning & finishing, etc. Outstanding ability to inhibit corrosion. Technical Bulletins.  
260I Mutual Chem. Co. of Amer.

**Chemicals, Coal Tar**.....Chemical Index contains 60 compounds, indexed alphabetically & by class. Provides chemical name, grade and availability. Also includes new compounds now available in commercial amounts.  
260J Reilly Tar & Chem. Corp.

**Chemicals, Fat**.....Reference wall sheet charts the composition & specifications of standard chemicals, derived from fats & oils. Shows, in alphabetical sequence, the common uses of these chemicals.  
260K Archer-Daniels-Midland

**Chemicals, Fine**.....Offers Data Sheets on many high purity process chemicals and their important industrial applications. Includes physical and chemical properties, suggested uses, containers, etc.  
260L Baker & Adamson Products

**Chemicals, Industrial**.....Physical properties, uses and products formed from alcohols, amines & ammonia, hydroxylamine salts, esters, nitroparaffins, etc. List of available market development chemicals. 4 p.  
260M Commercial Solvents Corp.

**Chemicals, Industrial**.....104 p. Bulletin describes properties, specifications, uses, shipping data, packaging for many heavy chemicals. Tables & graphs are included. Also company's history, growth, product line.  
260N Consolidated Chem.

**Chemicals, Industrial**.....Pertinent data on line of industrial—pharmaceutical—agricultural chemicals. These chemicals are available in quantity, processed to rigid specifications. Catalogue offers full details.  
123 Michigan Chem. Corp.

**Chemicals, Industrial**..... Illustrated booklet, "What It Is/What It Does," covers various company divisions: Industrial Chemicals; Organic Chemicals; Fine Chemicals; Research; Pigments; Plastics & Resins; etc.  
260O American Cyanamid Co.

**Chemicals, Industrial**.....For industry and laboratory. Company makes available 16 p. descriptive booklet, "Harshaw Chemicals for Industry & Laboratory," which offers pertinent data on their major activities.  
260P Harshaw Chem. Co.

**Chemicals, Laboratory**.....Offers new fully detailed Catalog listing chemicals for chemical, clinical, biological, bacteriological, metallurgical laboratories and industry. Includes full price data.  
260Q Arthur S. La Pine & Co.

**Chemicals, Laboratory**.....304 p. Catalog with largest listing (7344) of laboratory chemicals. Covers structural formulas, molecular weights, melting & boiling points, color index non. for dyes & stains. Cat. 115C.  
260R Fisher Scientific Co.

**Chemicals, Molybdenum**.....Molybdenum compounds widely used in production of catalysts, phosphomolybdicphosphotungstic lake colors, molybdate chrome orange pigments, etc. Technical product data.  
260S J. T. Baker Chem. Co.

**Chemicals, Organic**.....Company offers booklet which supplies important data on dispersing agents, polyvinyl acetate emulsions, as well as high styrene copolymer resins, high styrene copolymer latices & plasticizers.  
260T Dewey & Almy Chem. Co.

**Chemicals, Organic**.....Describes principal physical properties of more than 80 products which comprise the commercial, semi-commercial & laboratory chemicals offered by company. Catalog 54-1 available on request.  
260U Sharples Chem.

**Chemicals, Organic**.....Explanation of properties & uses for new chemicals: aleuritic acid, allyl cyanide, cantharidine, cerotic acid, lycopene, decacylene, glucovanillin, indoxyl, pyrrocoline & 3-pentadecanone.  
260V Bios Labs.

**Chemicals, Organic**.....New catalog includes over 2500 fine organic chemicals plus structural formulas, molecular weights, melting points, boiling points, specific gravities, refractive indices, and a cross index.  
260W Brothers Chemical Co.

**Chemicals, Organic**.....Supplement lists 47 additions. Contains name of the chemical, its melting or boiling point, structural formula, molecular weight & price. Also removals & price changes. List 33-2 available.  
260X Eastman Organic Chem.

**Chemicals, Organic**.....20 p. describes over 330 products & features 36 new chemicals. For easy reference they are arranged by family groups. Includes applications & physical properties in tabular form. Booklet F-6136.  
260Y Carbide & Carbon Chem.

**Chemicals, Photographic**.....Foremost in photographic chemicals—hydrocarbonate—sulfite—and other various photo pure chemicals. Makes available descriptive folder covering entire company product line.  
260Z A. R. Maas Chem. Co. Div.

**Chemicals, Rubber**.....Offers information on general-purpose ultra accelerator. Includes chemical & physical properties, applications, recommendations for use, etc. Compounding research report No. 22.  
260AA Naugatuck Chem. Div.

**Chloral**.....Complete information on physical properties, specifications, stability & storage, as well as shipping data, toxicity & precautions, reactions with organic compounds, etc. In 26 p. Technical Bulletin 206 offered.  
260BB Westvaco Chem. Div.

**Chlorine**.....Offers valuable technical bulletins: #7—"Liquid Chlorine"; #8—"Alkalies & Chlorine in Treatment of Municipal & Industrial Water"; #11—"Water Analysis"; #14—"Chlorine Bleach Solutions";  
260CC Solvay Process Div.

**Chlorine, Liquid**.....Presents new 72 p. technical and engineering service bulletin, "The Analysis of Liquid Chlorine and Bleach." Literature contains valuable data, tables, charts and indexes. No. 12.  
260DD Solvay Process Div.

**m-Chloroaniline Technical**.....Water-white to light-amber liquid that tends to darken on storage. It can be stabilized to retard color development. Company makes available fully detailed information.  
260EE E. I. duPont de Nemours

**Chlorobromomethane**.....Latest information on this new fire extinguishing agent just released in new booklet. Covers data on properties, history, suggested uses, etc. in Product Information Bulletin.  
260FF American Potash & Chem.

**Chloroform**.....New additions to Solvay line—chloroform, carbon tetrachloride, methyl chloride, methylene chloride—feature the same consistent purity & dependability. Furnishes samples & technical data.  
15 Solvay Process Div.

**Chromium Fluoride, Technical**.....Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-35771.  
259W Baker & Adamson.

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260GG H. C. Spinks Clay Co.

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260HH Turco Products

**Coatings & Adhesives**.....Technical data, recommended uses, citation of appropriate Foster specifications, etc. In 16 p. Describes 34 Foster coating & adhesive products & their uses. Foster Reference Manual.  
260II Benjamin Foster Co.

**Colorant Blends**.....Techniques used in dry coloring of Lustrex styrene colorant blend molding compound. Describes molding & coloring aids, equipment, colorants & methods for getting special effects. 29 p.  
260JJ Monsanto Chem. Co.

**Colors, Coating**.....New Bulletin discusses preparation of coating color with emphasis on casein formulations. Helpful in the control of conditions which promote production uniformity. Bulletin No. 832.  
260KK Calco Chem. Div.

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261A J. Lee Smith & Co.

**Concentrates, Arwax.....** Versatile hot melt combinations of synthetic polymers with paraffin & micro-crystalline waxes finding new uses among paper converters. Economical in use. Two Data Sheets issued—C45 and C46.  
261B American Resinous Chem.

**Copolymers, Styrene.....** Formulas developed to obtain high quality, low cost GR-S rubber compounds with high styrene resins. Includes gravities & physical properties. Three Bulletins available. C-11, 12, and 13.  
261C Dewey & Almy Chem. Co.

**Copolymers, Vinyl Chloride.....** Descriptive literature issued. New copolymers offer outstanding advantages of "built-in" plasticizer. Full information on preparation & properties provided in USDA Publication AIC-366.  
261D Agricultural Res. Service

**Copper Sulphate Crystals.....** New improved industrial crystals copper sulphate is readily adaptable to all types of solution equipment. Samples, specifications & detailed information made available by company.  
261E Tennessee Corp.

**Cosmetics, Drugs.....** Latest formulas for commercial products—for making creams, lotions, shampoos, lipstick, mascara. Pharmaceutical formulas included. Specification chart & emulsion techniques.  
261F Glyco Products Co.

**Cosmetics, Sunscreen.....** Data on new development in filters for ultra-violet light, especially useful for sunscreen cosmetics—(butyl carbityl) (6-propyl piperonyl) ether. Practically odorless oil of extremely low volatility.  
261G U. S. Industrial Chem. Co.

**Cupric Fluoride, Technical.....** Company makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-36481.  
259ee Baker & Adamson.

**Cyanuric Chloride.....** Offers 27 p. booklet which gives physical & chemical properties, reaction chart, potential applications, toxicity, tables of alcohol reactions & amine as well as related compound reactions.  
261H American Cyanamid Co.

**Cyclohexylamine.....** Cyclohexylamine is used as a dyestuff intermediate, petroleum additive, component in boiler water treatment, corrosion inhibitor & in organic syntheses. Offers Technical Bulletin.  
261I Monsanto Chem. Co.

**Decylbutyl Phthalate.....** Plasticizer has good low temperature properties & good heat & light stability. Recommended for extruded products (garden hose, gasketing, etc.) & sheeting applications. Information available.  
261J Naugatuck Chem. Div.

**Defoamers.....** For more efficient foam control. Versatile defoamers save space now wasted on foam, cut the processing time, eliminate waste & fire hazard of overflowing foam, etc. Offers complete details.  
261K Dow Corning Corp.

**Defoamers.....** For general use in the paper mill. New defoamer is highly effective as a defoaming agent in head box of paper machine & as an additive to top sizes. Details in Technical Data Sheet.  
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261M Universal Detergents

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262A Onkrite Products

**Detergents**.....Technical data on a heavy duty synthetic detergent based on tallow that features outstanding detergency at low possible cost. Can be used for warm or hot water washing of wool, cotton, etc.  
262B Antara Chem. Div.

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262D Virginia-Carolina Chem.

**Diammonium Phosphate**.....New method for automatic control of wool dyeing. Victor process offers relief from costly fluctuations in starting alkalinity, penetration, levelness, pH control, etc. Technical Bulletin V2-53.  
262E Victor Chem. Wks.

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262F Monsanto Chem. Co.

**Dibutyl Phosphite**.....Covers description, typical analysis, physical properties, as well as numerous suggested uses, typical reactions, toxicity and availability, all in detailed Technical Data Sheet No. S-35.  
262G Westvaco Chem. Div.

**Dibutyl Sebacate**.....Offers descriptive literature on highly efficient plasticizer widely used for low temperature applications in vinyl & rubber compounding. Also includes pertinent data on properties & specifications.  
262H Naugatuck Chem. Div.

**Dicarboxylic Anhydride**.....Bulletin covers chemical and physical properties, reactivity and many and varied suggested uses. Also includes a list of 68 literature references. All available in Technical Bulletin 1-5.  
262I National Aniline Div.

**m-Dichlorobenzene**.....Colorless mobile liquid with odor similar to other chlorinated aromatic compounds. Physical properties and chemical properties, uses, etc. given in Product Development Bulletin CB-1.  
262J Solvay Process Div.

**o-Dichlorobenzene**.....Pertinent data on o-Dichlorobenzene (Pure). Covers properties, eutectics, spectrometry, numerous reaction, suggested uses. Product Development Bulletin CB-2 available on request.  
262K Solvay Process Div.

**o-Dichlorobenzene**.....Essential physical properties & valuable technical information on safety procedures to be followed in loading & unloading, storing, handling & waste disposal. Safety Data Sheet SD-54.  
262L Mfg. Chemists' Assoc.

**p-Dichlorobenzene**.....Paradi offers many advantages — product-wise, profit-wise. Informative folder tells how to mold, compress, dissolve, perfume, color, and repackage. Complete information in Bulletin 454.  
262M Hooker Electrochem. Co.

**Dicyandiamide**.....Important product in synthesis of organic chemicals, is used in manufacture of resins, dye-stuffs, soap stabilizers, etc. Includes data on physical & chemical properties & applications.  
262N American Cyanamid Co.

**Di(2-ethylhexyl) Adipate**.....Provides technical data on DOA, a primary plasticizer which imparts excellent low temperature flexibility to polyvinyl chloride resins as well as synthetic rubbers. Bulletin O-106.  
262O Monsanto Chem. Co.

**Diisobutyl Ketone Vapors**.....Presents publication, "Toxicity & Hazard of Diisobutyl Ketone Vapors." Data on chemical properties, experimental procedure & results, and effects of human exposure to the chemical.  
262P Mellon Institute

**Diisooctyl Sebacate**.....An outstanding vinyl plasticizer in that it combines excellent low temperature properties & low volatility. Literature includes information on usage, properties, specifications, etc.  
262Q Naugatuck Chem. Div.

**Di-Isodecyl Phthalate**.....Presents information on outstanding primary plasticizer for polyvinyl chloride. Covers typical physical & electrical properties, application in polyvinyl chloride, shipping, etc. Bulletin O-108.  
262R Monsanto Chem. Co.

**Di-Iso-Octyl Phthalate**.....Company produces an effective primary plasticizer for vinyl resins, & compatible with all common vinyl polymers. Detailed information on properties & uses in Technical Service Bulletin E-7.  
262S Whitco Chem. Co.

**1,2-Dimethoxyethane**.....Makes available a detailed Technical Bulletin on 1, 2-dimethoxyethane—includes formula, constants, properties & uses, proper handling, and bibliography. Catalog No. 910.  
262T Arapahoe Chem.

**Dimethyl Sulfate**.....Bulletin describes highly reactive compound, found to be a useful methylating agent in organic synthesis. Includes information on specifications, properties, suggested uses, bibliography, etc.  
262U E. I. du Pont de Nemours

**Dinonyl Adipate**.....Dinonyl adipate is outstanding in its effectiveness as a low temperature, high efficiency plasticizer for vinyl compounds. New Bulletin gives information and includes properties & specifications.  
262V Naugatuck Chem. Div.

**Di(n-Octyl, n-Decyl) Phthalate**.....Booklet describes primary plasticizer which imparts low volatility and excellent flexibility to finished compositions. Applications, properties, specifications, etc. Bulletin O-109.  
262W Monsanto Chem. Co.

**Diethyl Phthalate**.....Shows marked superiority, with regard to: low color; low odor; low acidity; high heat stability; high ester content. Makes available specifications & sample quantities.  
262X Eastman Chem. Products

**Diethyl Phthalate**.....Company produces a colorless high boiling ester of outstanding value as a primary plasticizer for vinyl resins. Describes properties & uses of company line in Technical Service Bulletin E-6.  
262Y Witco Chem. Co.

**Dispersing Agents**.....Complete technical information on the action, most efficient use & advantages of these agents. Illustrated with charts, photographs & necessary instructions. 4 p. Bulletin 13.  
262Z R. T. Vanderbilt Co.

**Dispersions**.....Typical applications, densities, carriers & other important data. Includes list of 37 dispersions of colloidal graphite, molybdenum disulfide, vermiculite & zinc oxide. 4 p. booklet.  
262AA Acheson Colloids Co.

**Dispersions, Carbon Black**.....Product used for darkening of air-entrained or regular concrete in either monolithic or topping construction. Reduces road glare & driving hazards. Test data, uses, recommendations. 6 p. Brochure.  
262BB A. C. Horn Co.

**Driers, Odorless**.....Cobalt & lead driers retain metal concentrations & drying power without characteristic paint odor. Properties of these naphthenate driers are listed & described in Service Reports P-20 & P-21.  
262CC Witco Chem. Co.

**Duplicating Patterns**.....Basic material for preparation of duplicating patterns for Keller or Gorton duplicating machines possesses desirable qualities. Data on preparation, curing, etc. in Bulletin C-53.  
262DD Furane Plastics.

**Dyeing, Dacron**.....Benzoic acid offers numerous applications and one of its most important is as a carrier in the dyeing of "Dacron," polyester fiber. Bulletin describing this process is now available.  
262EE Monsanto Chem. Co.

**Dyeing, High Temperature**.....Dyeing of wool & other fibers at high temperatures under pressure. Impetus given to field by introduction of new hard-to-dye acrylic & polyester fibers. Description in Bulletin 833.  
262FF Calco Chem. Div.

**Dyes, Direct**.....Valuable information on direct dyes for resin after-treatment. Dyeing and fastness properties of dyes shown in detail by tables and graphs. Technical Bulletin obtainable upon request.  
262GG American Cyanamid Co.

**Emulsifiers**.....New descriptive Technical Bulletin F-2, "Armour Emulsifiers" & E-4, "Cationic & Non-Ionic Emulsifiers for Insecticides," offer pertinent data on company line for the emulsion technologist.  
262HH Armour Chem. Div.

**Emulsifiers**.....Company releases interesting report on four new emulsifiers for the formation of liquid insecticidal & herbicidal concentrates. Covers emulsifiers, emulsion properties, etc. Bulletin B-53-1.  
262II Thompson-Hayward Chem.

**Emulsifiers, Hydrocarbon**.....Useful all-phatic hydrocarbon emulsifier designed for emulsion degreasing, fuel oil desludging, as well as agricultural spray oils & other applications. Technical Bulletin No. 38.  
262JJ Emulsol Corp.

**Emulsifiers, Pesticide**.....Covers twelve formulations involving nine different pesticides that are especially adaptable for broad water-hardness conditions. Complete data given in Technical Bulletin No. 41.  
262KK Emulsol Corp.

**Emulsifiers, Pesticide**.....Bulletin provides information on a modified versatile type of pesticide emulsifier for toxaphene, chlordane, malathion, plus DDT, and certain herbicides. Technical Bulletin 39 is offered.  
262LL Emulsol Corp.

**Emulsions, Asphalt**.....Replacing more expensive materials in extending certain latex, starch, resins, and plastic glues. Stable, inert, lowest cost extenders you can buy. Complete details provided.  
262MM Amer. Bitumuls & Asphalt

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264C Armour Chem. Div.

**Ethyl Acetate.**.....Technical data sheet includes general description of compound, as well as CSC specifications, physical properties, uses, toxicity, shipping, handling & storage & shipping containers. TDS 20.  
264D Commercial Solvents Corp.

**Ethyl Acetoacetate.**.....Gives information on physical & chemical properties, specifications, shipping data, uses, potential applications. Intermediate used in pharmaceutical & dyestuff industries. Bulletin F-8292.  
264E Carbide & Carbon Chem.

**Ethyl Cellulose.**.....Describes use in specialty coatings. Contains startling formulations for many applications. Data on solvents & stabilizers used in ethyl cellulose coatings clearly discussed in 13 p. booklet.  
264F Hercules Powder Co.

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264G Carbide & Carbon Chem.

**Ethyl Silicates.**.....Releases new 20 p. comprehensive guide to use of ethyl silicate as refractory mold binder in precision investment casting. Complete information along with graphs & charts. Booklet F-8265.  
264H Carbide & Carbon Chem.

**Ethylene Amines.**.....Properties, specifications, shipping data, uses & application data for the amines—ethylene diamine, diethylene triamine, triethylene tetramine, tetraethylene pentamine. Given in Bulletin F-8163.  
264I Carbide & Carbon Chem.

**Ethylene Carbonate.**.....Powerful new solvent now available in commercial quantities. For use as a spinning solvent for synthetic fibers...as a solvent for resins. Complete information offered.  
264J Carbide & Carbon Chem.

**Ethylene Oxide.**.....Makes available informative literature dealing with the operating procedures for ethylene oxide...handling, storage & unloading. Contains charts, diagrams, etc. 16 p. Book F-7618B.  
264K Carbide & Carbon Chem.

**Ethylene Oxide.**.....33 p. provides technical information on ethylene oxide, ethylene glycol & diethylene glycol. Also includes uses, properties, as well as handling & storage features, safety precautions.  
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**Ethylene Polymer.**.....New Informative Market Development Bulletin covers suggested applications, properties, and includes blends with commercial polyethylene, and blends with paraffin and vegetable waxes.  
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264O Witco Chem. Co.

**Ferric Nitrate, Crystal, Technical.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-37441.  
264P Baker & Adamson.

**Fertilizer Manufacture Ammoniated.**.....Explains the obtaining of desired results in manufacture & conditioning of ammoniated mixed-goods. Also includes economical techniques in plant application. Bulletin 53.  
264P Universal Detergents.

**Fertilizers.**.....Detailed description of the manufacture, economic advantages to the farmer. As well as the chemical and physical properties, packaging, storage, acidity, etc. Special features cited. Bulletin PD-A12.  
264Q Allied Chem. & Dye Corp.

**Fiber Performance.**.....Techniques outlined for studying performance in many types of fiber blends. Text & photos explain "inner structures"—how made & their use in fabric quality studies & displays.  
264R Carbide & Carbon Chem.

**Flattening Agents, Alkyd-Urea.**.....Alkyd-urea flattening agents for synthetic finishes. Also data on Syloid AL-1 (prevents pressure build-up in metallic paints). Use, chemical & physical properties, etc.  
264S Davison Chem. Corp.

**Formalin Handling.**.....Manual covers instructions for unloading, storing, temperature effects, safety precautions. Also considers tankcar construction, methods of analysis, first aid, properties, specifications.  
264T Celanese Corp. of America.

**Fumigants, Soil.**.....Presents an informative leaflet outlining the use of a soil fumigant which provides dependable control over wireworms, nematodes and other soil pests. Most valuable applied ahead of plantings.  
264U Eston Chem. Div.

**Fungicides, Fruit.**.....Description of method to effectively control apple scab & cherry leaf spot. Results in increased yields & better finish & in production of higher quality fruit. Data offered on glyodin.  
264V Carbide & Carbon Chem.

**Fungicides, Fruit.**.....Years of successful results prove superiority. Growers get top notch growth, fruit set, and yield quality fruit...plus full disease control. Complete details. Bulletin on "Fermate".  
264W E. I. du Pont de Nemours.

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264X E. I. du Pont de Nemours.

**Furfural.**.....Product offers versatility, high purity, low price...for processes & products involving use as selective solvent, resin ingredient, wetting agent and chemical intermediary, etc. Bulletin 204.  
264Y Quaker Oats Co.

**Furfural.**.....Informative 28 p. covers properties, uses & shipping data for furfural, furfuryl alcohol, tetrahydrofurfuryl alcohol, furoic acid, etc. Illustrated Bulletin 201-A. Available on request.  
264Z Quaker Oats Co.

**Gelling Agents.**.....Gelling agents find new application in rapidly growing field of vinyl plastisols & organosols. Also particularly suitable for production of plastigels. Technical Service Bulletin No. G-5.  
264AA Witco Chem. Co.

**Glucuronolactone.**.....Company offers Glucuronolactone which has become important in biochemistry & is now readily available for both study and use. Offer informative booklet covering properties & clinical aspects.  
264BB Corn Products Refining.

**Glycerine.**.....Many properties make it preferable for toilet preparations. Safe for use in pharmaceuticals. Company offers booklet with complete information, "Why Glycerine for Drugs and Cosmetics?"  
264CC Glycerine Producers' Assoc.

**Glycerine.**.....Important ingredient in many confections, flavoring agents, and other food products. Manufacturer provides information on properties & applications in 16 p. booklet, "Why Glycerine for Foods?"  
264DD Glycerine Producers' Assoc.

**Glycerine.**.....New booklet offered by producer, "Glycerine—Preferred for Product Conditioning" outlines properties that make glycerine preferable in conditioning toilet goods & pharmaceuticals, etc.  
264EE Glycerine Producers' Assoc.

**Glycerine.**.....Offers complete and detailed information on glycerine's chemical and physical properties, included in available descriptive reference, "Why Glycerine for Alkyd Resins and Ester Gums?"  
264FF Glycerine Producers' Assoc.

**Gum, Guar.**.....Company offers informative booklet which describes new hydrophilic colloid and presents technical data of its physical and chemical properties. 16 p. Booklet on Jaguar. Includes charts etc.  
264GG Stein, Hall & Co.

**Gum, Karaya.**.....Includes valuable data on importation, processing & usage of natural gum karaya. Shows ability to gel in cold water. Covers advantages & lists applications in illustrated 8 p. reference.  
264HH Morningstar, Nicol.

**Hafnium Carbide.**.....New data on properties of compound. Now described in literature references which indicate hafnium carbide is a super-refractory compound...and is among the hardest materials known.  
264II Union Carbide and Carbon.

**Herbicides.**.....Informative booklet covers use for weed control. Includes sections describing herbicidal action, soil life & application of Chloro-IPC—as well as a list of weeds it controls. Bulletin O-114.  
264JJ Monsanto Chem. Co.

**Herbicides.**.....Company produces selective, systemic weed-killers particularly suited for killing many grassy & broadleaved weeds in cotton. Advantages & uses given in illustrated Ho-No-Mo Handbook.  
264KK Spencer Chem. Co.

**Herbicides.**.....Especially designed to control pigweed, purslane, ragweed, etc. in asparagus and certain other cucurbits. Data on how to use, when to use, recommended dosages. Illustrated Booklet 16-A.  
264LL Naugatuck Chem. Div.



**Herbicides**.....26 p. lists nearly 1000 weeds classified according to their reaction to 2,4-D (highly effective herbicide). Physical & chemical data on 2,4-D & application methods found in Bulletin 0-50.  
265A Monsanto Chem. Co.

**Herbicides**.....Manufacturer now produces superior formulations for cotton weed control. Repeated demonstrations show they are safest compounds available. Many promising uses. CIPC Bulletin offered.  
265B U. S. Industrial Chem. Co.

**Hexachlorophene**.....Presents the effectiveness of hexachlorophene. Employed in the cosmetic field and used widely as a skin-degerming and deodorizing agent. 8 p. Technical Bulletin H-1 includes bibliography.  
265C Sindar Corp.

**Hydrazine**.....Now available in several forms & in a number of derivatives. Has many uses—as an exceptionally effective reducing agent, oxygen scavenger & nitrogen “building block.” Complete details.  
265D Mathieson Chem. Corp.

**Hydrides, Metal**.....Covers hydride process, titanium and zirconium (storage, handling, drying), special metals and alloy powders, calcium hydride, sodium hydride, sodium borohydride, etc. The Hydrimet Process.  
265E Metal Hydrides.

**Hydrides, Metal**.....Makes available a 24 p. illustrated Brochure, with pertinent information on the activities, products developed and manufactured, departments, services, and personnel of the company.  
265F Metal Hydrides.

**Hydrogel**.....Manufacturers are using economic hydrogel to induce microporosity in rubber, resins and plastics. Colorless, translucent, and available in semi-solid lumps or finely divided. Product Data Sheet.  
2660 Davison Chem. Corp.

**Hydrogen Peroxide**..... $H_2O_2$  is an extremely powerful oxidizing agent which can be used to advantage in a large number of organic reactions involving the benzene ring. Booklet covers properties & applications.  
265H E. I. du Pont de Nemours.

**Hydrogen Peroxide**.....Critical summary of most useful methods of assaying hydrogen peroxide solutions at all concentrations and under almost every conceivable condition. Bulletin 59 offered by company.  
265I Buffalo Electro-Chem. Co.

**Hydrogen Peroxide**.....Discusses stability of hydrogen peroxide in concentrations above 90% by weight, and factors which influence its rate of decomposition. Bulletin No. 55 Provides complete information.  
265J Buffalo Electro-Chem. Co.

**Hydrogen Peroxide Handling**.....New bulletin includes study of heat balance in hydrogen peroxide storage vessels & recommendations on the handling & storage of material. Charts & graphs in Bulletin 54.  
265K Buffalo Electro-Chem. Co.

**Hydroxylamine Salts**.....Acid sulfate, neutral sulfate, chloride. Unique reactivity characteristics. Wide range of utility. Uses, physical properties, toxicity, stability, shipping, handling, etc. New Series TDS 19.  
265L Commercial Solvents Corp.

**12-Hydroxystearin**.....Present technical data on Castorwax 12-hydroxystearin. Gives valuable explanation on where and why low-cost Castorwax is used. Includes formulation information. Technical Bulletin #7.  
265M Baker Castor Oil Co.

**Inhibitors, Plant-Growth**.....Especially designed to prevent development of suckers on tobacco... with no reduction in yield or adverse effect on quality. Features & directions for use given in illustrated Booklet 22.  
265N Naugatuck Chem. Div.

# OPERATION BEST SILENCING!

Special Orders:

BURGESS-MANNING Exhaust and Intake

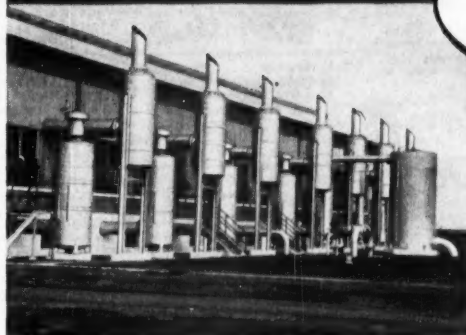
Snubbers installed for Tennessee

Gas Transmission Company

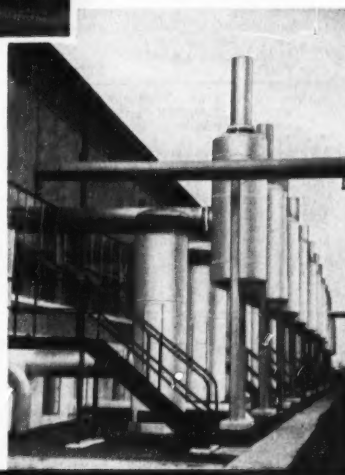
...engineered for this service.

...built to meet specific requirements.

OVER  
100 SNUBBERS



Above: Seven exhaust snubbers and seven combination air filter snubbers designed to meet the silencing requirements of seven 2,000 h.p. gas engines at Station #9, Bloomington, Texas.



Below: Exhaust snubbers and combination air filter snubbers engineered and built for four 1,600 h.p. and eight 2,000 h.p. gas engines at Station #1, Agua Dulce, Texas.

Proper silencing is one of the keynotes of efficiency. That is the reason Tennessee Gas Transmission Company, operator of one of the major trunk line systems in the country, consulted Burgess-Manning Sound Engineers on their silencing requirements. Over one hundred snubbers were engineered and constructed by Burgess-Manning to eliminate the intake and exhaust noises at compressor stations along the Tennessee line.

For engineering data on your problem of noise control, call a Burgess-Manning Sound Engineer.

## BURGESS-MANNING COMPANY

1203 DRAGON STREET  
DALLAS, TEXAS

Sound Engineering

LIBERTYVILLE, ILL.  
CHICAGO, ILL.

**Insecticide Sprays.**.....Outlines the characteristics and use of an insecticide spray which is non-residual and which may be used safely up to within 24 hours of picking or harvesting Estron Tetron\*-50 leaflet.  
**266A** Eaton Chem. Div.

**Insecticides.**.....Describes properties and usages of Malaphos—a remarkably safe, effective insecticide. Recommended for use on such crops as tomatoes, apples, pears, peas, etc. Malaphos leaflet.  
**266H** EstonChem. Div.

**Intermediates.**.....Provides illustrated, 30 p. complete booklet with valuable data on line of organic intermediates. Nomenclature & classification system facilities location & ordering of listed compounds.  
**266C** Hilton-Davis Chem. Co. Div.

**Intermediates.**.....Company now offers detailed brochure, "Individualized Intermediates," which makes available pertinent physical characteristics of a number of intermediate organic compounds.  
**266D** Michigan Chem. Corp.

**Ion Exchange.**.....Informative catalogue outlines ion exchange technology and industry uses. Fundamental ion exchange processes described with aid of detailed drawings. Also covers many applications. 14 p.  
**266E** Rohm & Haas Co.

**Isobutyraldehyde.**.....Manufacturer offers valuable publication prepared particularly to stimulate the thinking of industrial research and development personnel concerning isobutyraldehyde & its derivatives.  
**266F** Eastman Chem. Products.

**Isopropyl Acetate.**.....Data on physical & physiological properties, as well as applications, specifications, shipping, resin, solubilities, constant boiling mixtures, performance in nitrocellulose lacquers, etc. Bulletin No. F-8295.  
**266G** Carbide & Carbon Chem.

**Ketones.**.....44 p. booklet. Explanations of uses, physical properties, shipping data, specifications, constant boiling mixtures. Discusses 14 ketones sold in commercial quantities. Graphs, charts, photos.  
**266H** Carbide & Carbon Chem.

**Latex.**.....Producer announces the development of an improved latex adapted for clay coated paper. Describes improvements along with data on properties handling techniques, etc. Illustrated, 31 p.  
**266I** Dow Chem. Co.

**Latex.**.....New Technical Bulletin on use for exterior masonry paints. Includes information on properties & results of 3 experimental exterior paint formulations based on Dow Latex 512-K.  
**266J** Dow Chem. Co.

**Latex.**.....Broad general principles for application and handling of many aqueous colloids, including latex, Lotol, Naugatex compounding pastes, etc. 16 p. Bulletin No. 100 provides complete information.  
**266K** Naugatuck Chem. Div.

**Latices, Styrene-Butadiene.**.....Uses and characteristics of styrene-butadiene latices which have been offered in five different copolymer ratios, are described in inclusive 11 p. Technical Bulletin C-4-191.  
**266L** Koppers Co.

**Lead Nitrate, Crystal, Technical.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-35381.  
**269kk** Baker & Adamson.

**Lead Tetra-Acetate.**.....Technical Bulletin features data on: formula, molecular weight, composition and appearance; reactions and uses; precautions and handling; correct storage; etc. Catalogue No. 908.  
**266M** Arapahoe Chem.

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**Leavening Agents.**.....Illustrated. 22 p. discusses suggestions on proper use of leavening agents in previously prepared mixes, self-rising flour & other applications. Technical data on full line produced by company.  
**266N** Monsanto Chem. Co.

**Lithium.**.....Manufacturer offers addition of high-grade lithium ores—includes Lepidolite (3.5% minimum Li<sub>2</sub>O) Petalite to meet growing demands of industry. Complete technical data now available.  
**266O** American Potash & Chem.

**Lubricants.**.....Satisfy requirements of conveyor idlers. Regardless of size and type of machinery, lubricants will improve its operation and reduce maintenance costs. Prevent wear and corrosion. 56 p. Data Book.  
**266P** Flake Bros. Refining Co.

**Lubricants.**.....Company makes available a new 36 p. treatise, "Proper Lubrication....The Life Blood of all Machinery," which deals with the important subject of modern lubrication. Data Book 54-1.  
**266Q** Flake Bros. Refining Co.

**Lubrication, Open Gear.**.....Lubrication from viewpoint of research & laboratory control. Chemical & physical characteristics of more commonly used gear lubricants. Data, on application, storing, handling, etc.  
**266R** Brooks Oil Co.

**Magnesium.**.....Offers industry's most complete line of magnesium designed for broadest range of application. Useful and valuable Bulletin covers descriptions, properties, uses of over a dozen different grades.  
**266S** Westvaco Chem. Div.

**Magnesium Aluminum Silicate.**.....Veegum is purified colloidal magnesium aluminum silicate. Non-toxic & non-irritating, it is opaque, white, & non-gelatinous. Data in Veegum Bulletin No. C122.  
**266T** R. T. Vanderbilt Co.

**Melamine.**.....Offers up-to-date treatise including specifications, physical properties, chemistry and structure, applications, toxicity, test methods and an extensive bibliography. "The Chemistry of Melamine".  
**266U** American Cyanamid Co.

**2-Mercaptobenzimidazole.**.....Compound is soluble in alcohol, ethyl acetate and acetone. It is insoluble in other common organic solvents and has a melting point of 295-306° C. Data Sheet provides useful information.  
**266V** Monsanto Chem. Co.

**Methanol.**.....Offers important uses—intermediate for formaldehyde & methyl chloride; fuel for heating insulated railroad cars; anti-freeze for gasoline; solvent for vinyl acetate, adhesives, surface coatings and ink, etc. F-8141.  
**266W** Carbide & Carbon Chem.

**Methionine Hydroxy Analogue.**.....16 p. booklet describes this poultry feed supplement. Discusses its value in broiler feeds based on various tests. Contains information on history, application & efficiency of chemical.  
**266X** Monsanto Chem. Co.

**Methyl Amyl Acetate.**.....Company literature includes physical & physiological properties, specifications & shipping data, as well as resin solubilities, performance in nitrocellulose lacquers, etc. In Bulletin No. F-6264.  
**266Y** Carbide & Carbon Chem.

**Methyl Bromide.**.....Offers a new informational catalogue to acquaint the trade with new uses found for methyl bromide in recent years. Also includes information on the company line of M-B-C fumigants.  
**266Z** Eston Chem. Div.

**Methyl Toluene Sulfonate.**.....Company offers useful, informative technical Data Sheet with information on methyl toluene sulfonate—a mild methylating agent used primarily in the manufacture of pharmaceuticals and dyes.  
**266AA** Monsanto Chem. Co.

**Methylamines.**.....Represent most economical source of amine group due to their low equivalent wts. and moderate cost. Many uses, specifications, properties, etc. included in Technical Data Sheet 12.  
**266BB** Commercial Solvents Corp.

**Methylamines.**.....Methylamines found valuable due to their low cost & low equivalent weight... they are ideal sources of basic organic nitrogen. Used as intermediates for many products. Company offers technical data.  
**266CC** Rohm & Haas Co.

**Methylene Chloride.**.....Reference covers typical physical properties, solubility in various liquids, azeotrope formation, handling & storage, as well as toxicity, shipping, uses, reactions. Product Development Bulletin CM-1.  
**266DD** Solvay Process Div.

**Mildew Preventive.**.....Effective & permanent treatment for prevention of bacteria damage. Eliminates need for bactericides in mills to check mildew. New technical literature covers application & usage.  
**266EE** F. C. Huyck & Sons.

**Molding Compounds, Kralastic.**.....Manufacturers are able to produce outstanding toughness & rigidity without sacrificing other desirable properties. Sections cover types & applications, fabrication, properties. 20 p.  
**266FF** Naugatuck Chem. Div.

**Molybdenum, Sprayed.**.....Expanded use of Sprabond wire—essentially pure molybdenum, in a form suitable for metallizing use. Includes characteristics & applications in Bulletin No. 57C available on request.  
**266GG** Metallizing Engrg. Co.

**Monomers, Acrylate & Methacrylate.**.....Ability of copolymers containing acrylates or methacrylates to resist aging is superior to that of corresponding acrylic-free polymers. Information in 38 p. Booklet.  
**266HH** Rohm & Haas Co.

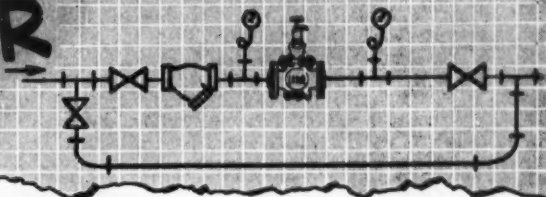
**Morpholine.**.....Bulletin provides useful data on physical & chemical properties, uses & potential applications, & presents vapor pressure, specific gravity, viscosity, surface tension, & other curves.  
**266II** Jefferson Chem. Co.

**Naphthas, Aromatic Petroleum.**.....Line of complete series of petroleum fractions enables many manufacturers to select suitable substitutes for the common coal tar solvents at a substantial savings.  
**266JJ** Pennsylvania Indus. Chem.

**Naphthas, Heavy, Coal Tar.**.....These are semi-refined, selected coal tar fractions having excellent solvency for application ranging from wire enamels to roof coating compounds. Specifications & samples.  
**266KK** Pennsylvania Indus. Chem.

**o-Nitrochlorobenzene.**.....Product offers wide number of uses. Noted for its versatility and high reactivity in the production of many derivatives which serve as intermediates. ONCB Bulletin available.  
**266LL** Monsanto Chem. Co.

# WHEN TO USE A REGULATOR



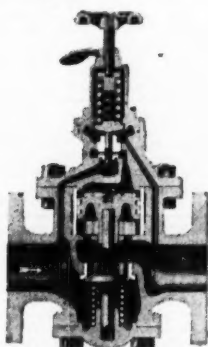
## SELF-CONTAINED PRESSURE, TEMPERATURE AND PUMP PRESSURE REGULATORS

**Leslie Self-Contained Regulators** are spring loaded, internal pilot, piston or diaphragm operated with stellite seating surfaces, hardened stainless steel main valves and renewable wearing parts of heat treated stainless steel of grades best suited to the application.

Regulators are used for any one or any combination of the following conditions:

- ★ When quick response is necessary to handle sudden load changes.

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- ★ When one-step pressure reductions are desired.
- ★ When service conditions require continuous flow for varying demand.
- ★ When "instrument control" is required without auxiliary operating force.
- ★ When installation requires smallest physical dimensions.
- ★ When operation from either a nearby or a remote control station is desired.

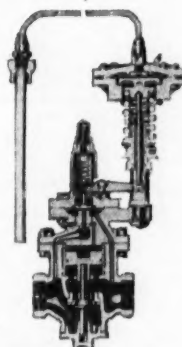


Pressure Reducing Valve  
Class L-3

### LESLIE PRESSURE REDUCING VALVES

Automatically maintain a constant reduced pressure of steam, air or gas. Single seated, tight closing. Respond instantly to load changes. Renewable, interchangeable parts. Stellite seating surfaces. Complete overhaul permitted without removing body from pipe line. Made in bronze, cast iron, cast steel or cast alloy steels. Sizes  $\frac{1}{2}$ " to 6". Other units available for constant differential pressure, unloading, and for remote adjustment. Inlet pressures 25 psi to 1500 psi steam at 950°F. Reduced pressures 2-600 psi.

SEND FOR BULLETIN 5302



Temperature Regulator  
Class LTCO

### LESLIE TEMPERATURE REGULATORS

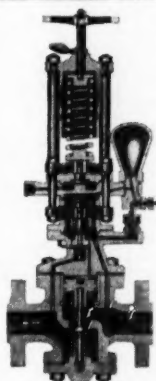
Designed for a wide range of applications. Vary the flow of steam or cooling water to heater or process to automatically maintain constant temperature. Rugged 100° F. adjustable range thermostatic element. For small and large flows, direct operated, direct and reverse acting or with "Duomatic", two-element (pressure and temperature) control. For driers, fuel oil heaters, instantaneous and storage heaters, kettles, open tanks, ovens, process heaters, degreasing machines, steam tables, sterilizers, storage heaters, urns, etc.

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### LESLIE PUMP PRESSURE REGULATORS

Accurately and automatically control discharge pressure from steam operated, reciprocating or turbine driven pumps. Single seated—positive—responsive and accessible. No packed plungers or stuffing boxes. Built for constant discharge pressures of 8 psi to 2000 psi and excess pressure of 10-200 psi. For motor-driven pump discharge pressure recirculation.

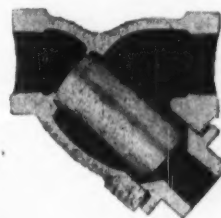
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Pump Governor  
Class CTHS-3

### LESLIE SELF-CLEANING STRAINERS

Recommended to protect all regulating equipment from dirt and foreign matter. Cast iron, bronze, cast steel, carbon moly, chrome-moly, stainless and forged steels. Strainers with screwed, flanged, socket and butt welded connections; sizes  $\frac{1}{4}$ " to 10" inclusive. Primary service ratings to 2500 psi. Screens furnished in Monel and stainless steel with various perforations and meshes for liquid, gas, air, oil and steam services. For complete details on each type, ask for Bulletin 5308.



Self-Cleaning Strainer

5169

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# REGULATORS

LESLIE CO., 279 GRANT AVENUE • LYNDBURST, N. J.

"STILL FAR AHEAD IN QUALITY AND PERFORMANCE"



**Nitrogen Products**....Company literature covers new plant, in Memphis, Tenn., designed to produce 72,000 tons of nitrogen annually, in the form of urea and anhydrous ammonia. 20 p. illustrated Booklet offered.  
268A Grace Chem. Co.

**Nitrogen Solutions**.....60 p. includes valuable data on ammoniating liquids, ammoniation and recommended handling procedure. Booklet complete information with numerous illustrations, tables, and graphs.  
268B Spencer Chem. Co.

**Nitroparaffins**.....Covers nitroethane, nitromethane, 1-nitropropane & 2-nitropropane. Describes specifications, physical properties, uses, shipping, handling & storage, etc., in Technical Data Sheet 23.  
268C Commercial Solvents Corp.

**Oils**.....Informative illustrated booklet provided by company outlines company's history since founding, and contains a consideration of operation today with a short description of 13 basic products. 16 p. inclusive.  
268D Pennsylvania Refining Co.

**Oils, Essential**.....Includes prices on essential oils, aromatic chemicals, animal fixatives, oleoresins, colors, gums, balsams, etc. Distribution limited to those who buy in wholesale quantities. 10 p. Bulletin.  
268E Fritzsche Bros.

**Oils, Essential**.....26 p. catalog supplies valuable information on essential oils, fixed oils, infused oils, balsams, concentrated flavors, fruit elements, oleoresins, basic perfume oils, etc. Includes data on personnel.  
268F Magnus, Maboe & Reynard

**Oils, Heavy**.....Characteristics of heavy oils make them ideal for weed killing oils, sludge solvents & tar cutbacks. Also useful in the manufacture of insecticides & disinfectants. Specifications & samples.  
268G Pennsylvania Industrial Chem.

**Oils, Solvent**.....Includes Shingle Stain Oil, neutral extenders for creosote, holder oils for the gas industry and thinners for bituminous paints. Used in numerous other applications. Specifications and samples.  
268H Pennsylvania Indus. Chem.

**Oils, Sperm**.....Literature describes sperm oil & sperm oil products. Data on characteristics, chemical & physical properties, composition of 12 oils & waxes, solubility, etc. Included in Bulletin 94A.  
268I Archer-Daniels-Midland

**Oils, Tall**.....Company booklet covers methods of refining & testing tall oils & offers information on materials for storage & processing equipment. Also industrial applications. Bulletin No. C-53 available.  
268J K. A. Steel Chem.

**Paint Formulating, Masonry**.....Bulletin P-126, "Aerocolors in Formulating High Styrene-butadiene Copolymer Surface Coatings (Pilotite S-5 Resins)." Includes typical properties and characteristics of product line.  
268K Monsanto Chem. Co.

**Papermaking**.....24 p. outlines the properties of paper chemical products & describes use in papermaking. Also includes resins & sizes & a brief history of development work in field. Illustrations & charts.  
268L American Cyanamid Co.

**Pentachlorophenol**.....Illustrates clearly the procedure for determining amount of pentachlorophenol in oil solutions. Includes a list of equipment required for procedure. Kit of materials available upon request.  
268M Wood-Treating Chem. Co.

**Pentaerythritol**.....Offers resin-makers valuable advantages. Makes available illustrated literature covering features, physical properties, industrial applications, alkyl resin production, etc. 12 p.  
268N Celanese Corp. of America.

**Perfume Specialties**.....Includes recommendations for use, as well as solubility and other technical information. Suggestions are offered for new industrial applications. Complete details in 7 p.  
268O Polak & Schwarz.

**Perfumes**.....An illustrated brochure, "How the D & O Laboratories Serve You," offers data on perfume, industrial, odorant, aerosol, flavor & dry soluble seasonings product development laboratories.  
268P Dodge & Olcott.

**Peroxygen Chemicals**.....Describes completely bleaching methods for cotton, rayons, nylon & animal fibers. Also covers cold bleach & continuous bleach processing in detail. Discussed in Bulletin No. 52.  
268Q Buffalo Electro-Chem Co.

**Peroxygen Compounds**.....Especially adaptable for bright dips, metal cleaning, passivating & inhibiting. Involves steel, aluminum, brass, silver, stainless steel. Solution formulae, use, examples included. Bulletin 51.  
268R Buffalo Electro-Chem Co.

**Pesticides**.....Presents a detailed study in field of soil pesticide formulations. Discusses properties of company's granular carriers, and covers such matters as formulations, application techniques, etc.  
268S Attapulgis Minerals.

**Petrochemicals**.....New petrochemical plant now making high-purity aromatics—nitration benzene, as well as nitration toluene, and ten degree xylene. Company presents pertinent information in technical bulletins.  
268T Sun Oil Co.

**Petroleum Products**.....Booklet contains descriptive data, on petroleum products and makes available specifications and applications for white oils, petrolatums, odorless solvents, petroleum sulphate, and soluble oil bases.  
268U Pennsylvania Refining Co.

**Pharmaceuticals, Bulk**.....For buyers of Pharmaceuticals. Company makes available new 1954 Price List which includes data on bulk pharmaceuticals, intermediates, as well as amino acids, reagents, enzymes.  
268V Winthrop-Stearns.

**Phenolic Molding Compounds**.....Photographs of molded parts, supported by property data tables & by case histories from industrial molders, illustrate economic advantages. "Bakelite Molding News."  
268W Bakelite Co.

**m-Phenols**.....B.R.—207-230°C. Mixture of cresols, xylenols, & ethyl phenols—2,2 ortho & para positions per molecule are open. Phenol & 2,6-xyleneol absent. Phenolic content—about 98%. Form 8107 available.  
268X Carbide & Carbon Chem.

**Phenols, High Boiling**.....B.R.—230-279°C. Mixture of short-chain alkyl-substituted phenols—2,5 of three reactive ortho & para positions are open. Phenol & cresols absent. Phenolic content—98%. Form No. 8103  
268Y Carbide & Carbon Chem.

**Phenyl Ethanolamines**.....Company provides data on phenyl ethanolamine, phenyl diethanolamine, phenyl methyl ethanolamine and phenyl ethyl ethanolamine. Uses, properties, shipping data, etc. Bulletin F-8280.  
268Z Carbide & Carbon Chem.

**Phloroglucinol**.....Covers physical & chemical properties, occurrence & manufacture, specifications & standards, health & safety considerations, typical uses, derivatives & bibliography. 6 p. detailed Article.  
268AA Ringwood Chem. Corp.

**Phosphorus Pentasulfide**.....Intermediate in the manufacture of thiophosphates for oil additives, flotation agents, insecticides, & other chemicals. Makes available samples & technical information.  
268BB Victor Chem. Wks.

**Phosphorus Products**.....Quality assured by rigid control from mines to finished product... service assured by large-scale production and ample phosphate rock reserves. Complete information provided in catalog.  
268CC Amer. Agricultural Chem.

**Pigments, Iron Oxide**.....Reduce grinding & dispersing time in paints & allied products as much as 75%. Physical & chemical specifications & suggested applications can be obtained in valuable VVF Tech Report.  
268DD C. K. Williams & Co.

**Plasticizers**.....Company line offers numerous features: lower cost; less migration; as well as better U. V. light stability; better low temperature flex; etc. Catalog provides full technical information.  
268EE Ohio-Apex Inc. Div.

**Plasticizers**.....Catalogue provides descriptions and data on dimethyl phthalate, diethyl phthalate, triacetin, tributyltin, di-isobutyl adipate, etc. Includes many and varied specifications, properties and typical uses.  
268FF Eastman Chem. Products.

**Plasticizers**.....Manufacturer provides 26 p. bulletin which explains why and how plasticizer can be used profitably in polyvinyl acetate emulsion adhesives. Bulletin includes 8 tables which offer pertinent test data.  
268GG Atlas Powder Co.

**Plasticizers**.....New Catalogue provides valuable information on plasticizers used by the plastics, coatings and rubber industries, in extensive detailed booklet No. F-5832, "Flexol Plasticizers."  
268HH Carbide & Carbon Chem.

**Plasticizers**.....63 p. detailed booklet supplies valuable information on company line of plasticizers. Includes data on the typical uses, chemical and physical properties, specifications, selection, etc.  
268II Monsanto Chem. Co.

**Plasticizers, Azelate**.....Direct comparison proves advantage of azelates over other aliphatic diester plasticizers. Comparison given in company literature. Presents a descriptive Booklet covering all Plastolein plasticizers.  
268JJ Emery Industries.

**Plasticizers, Citrate**.....Manufacturer offers group of 4 citrate plasticizers... each with special properties that determine its use. Feature an extremely low order of toxicity. Technical Bulletin 31.  
268KK Chas. Pfizer & Co.

**Plasticizers, Epoxy Vinyl**...Product line will give vinyl sheeting, coatings & extruded or molded products superior permanence & durability—even under the most severe conditions. Information in Technical Bulletin.  
268LL Archer-Daniels-Midland

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268MM Monsanto Chem. Co.

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268NN Monsanto Chem. Co.

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**Plasticizers, Vinyl.** . . . . Producer provides booklet which covers new series of vinyl plasticizers, epoxy, fatty acid esters. Text and data presented in tables and photos show plasticizer performance. Bulletin 56 offered.  
269A Buffalo Electro-Chem. Co.

**Polybutenes.** . . . . For quality improvement & cost reduction of caulking & sealing compounds. Other uses in adhesives, surgical & industrial tapes, rubber products, etc. Bulletin 12 available on request.  
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**Polyesters.** . . . . Company makes available a 52 p. basic working text for polyester formulators and users. Divided into 4 sections, the manual provides detailed data on composition and utilization of polyesters.  
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269G American Polymer Corp.

**Polymers, Propylene Oxide.** . . . . Ucon fluids & polypropylene glycols 150, 425, 1025, & 2025 are excellent lubricants & also may be used in hydraulic fluids. Offer details in Booklets P-8326, and P-7220.  
269H Carbide & Carbon Chem.

**Polyols.** . . . . Useful and interesting technical data on non-crystallizing plasticizing polyol for moisture-conditioning. Covers physical properties, advantageous characteristics, applications, shipping, etc.  
269I Atlas Powder Co.

**Polystyrene Beads.** . . . . Manufacturer furnishes detailed information on expendable polystyrene beads and polystyrene foam. Includes advantages, properties, applications, etc. Technical Bulletin No. C-4-200-T.  
269J Koppers Co.

**Polystyrene, Expandable.** . . . . Can be molded into a variety of shapes for low temperature insulation—refrigerators, freezers, air conditioners & piping. Makes available complete information.  
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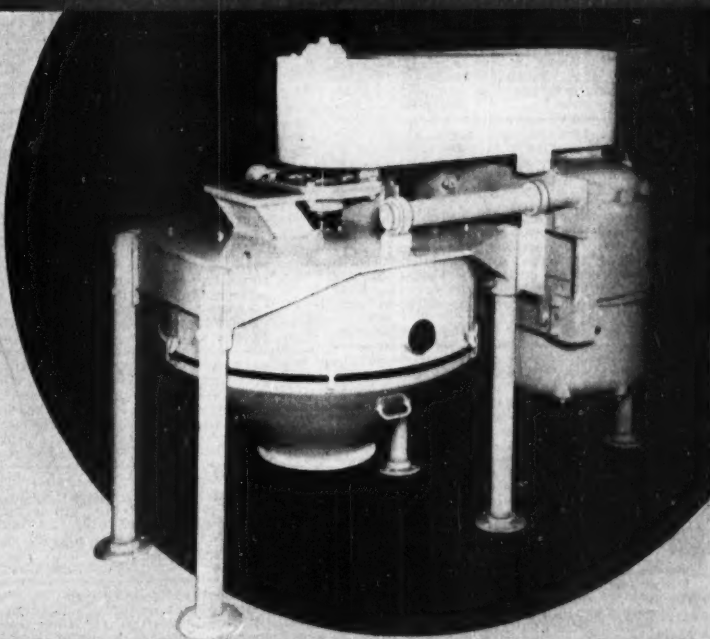
**Polyurethanes.** . . . . Designed for adhesive applications. Lists raw materials & chemical reactions involved in adhesive system. Applications in other fields. Bond strengths, properties, etc. Bulletin P-151.  
269L Monsanto Chem. Co.

**Polyvinyl Acetate Beads.** . . . . Finding increased uses in formulation of adhesives, inks, coatings, saturants, etc. Includes data on grades, properties, shipping and storage. Further pertinent information in PVB 510.  
269M Colton Chem. Co.

**Polyvinyl Acetate Emulsions.** . . . . Used as basic material in adhesives for wood, fiber, cork, ceramics, leather, etc. Covers uses, applications, properties. Includes data on handling & storage. PVB 501A.  
269N Colton Chem. Co.

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**Preservatives, Emulsion Paint.**..... Describes preservatives which provide greater protection for emulsion paints... at a lower cost. Covers performance, savings, handling, toxicity, effluence & tests. 270E Scientific Oil Compounding.

**Propylene Oxide.**..... Expands production of propylene oxide... to meet increasing industrial need for this excellent intermediate. Covers data on applications in Technical Information Sheet F-8485. 270F Carbide & Carbon Chem.

**Pyridine.**..... Offers literature which describes uses and properties and includes valuable information on the company's new recovery service which enables users to appreciably reduce pyridine costs. Fully detailed. 270G Pittsburgh Coke & Chem.

**Resins.**..... Describes use of casting resins for encapsulation embedment of electronic components and circuit assemblies. Offered in number of formulations. Find complete data 14 p. Brochure. 270H Aries Labs.

**Resins.**..... Valuable information on the basic advantages of Epon resin-based formulations—excellent adhesion, resistance to abrasion & impact, etc. in detailed reference, "Epon Resins for Surface Coatings." 270I Shell Chem. Corp.

**Resins.**..... Includes pertinent data concerning the properties of full company line of coumarone-indene resins, modified coumarone-indene resins, oxidizing resins, etc. Also information on the latest prices. 270J Neville Chem. Co.

**Resins.**..... Information on two aryl sulfonamide formaldehyde condensation resins which meet most of the exacting requirements of specialty formulations of cellulose esters. Outstanding for use in spray lacquers. 270K Monsanto Chem. Co.

**Resins, Alkyd.**..... Outside house paints which contain the new alkyd resin provide cleaner, whiter surfaces after exposure and improved over-all durability. Company offers detailed information on valuable product. 270L U. S. Industrial Chem. Co.

**Resins, Dispersion.**..... Covers uses, properties & methods of applying Bakelite vinyl resin-base organosols, plastisols & plastigels. Literature illustrated with fifteen typical applications. Booklet VE. 270M Bakelite Co. Div.

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**Resins, Fluorothene.**..... 16 p. booklet, "Bakelite Fluorothene Resins—Properties, Forms, Fabrication," covers valuable information on history, chemical structure, properties, fabrication, and applications. 270O Bakelite Co.

**Resins, Ion Exchange.**..... Nalcite cation and anion exchange resins perform with a dependability and efficiency that command confidence throughout the industry. Details in Bulletin 57, 58, and 60. 270P National Aluminate Corp.

**Resins, Polyester.**..... Covers the latest information with regard to formulations and properties of Bakelite polyester resins and their use in the manufacture of reinforced plastic structures. Booklet No. L-10. 270Q Bakelite Co. Div.

**Resins, Polyester.**..... Makes available 20 p. illustrated brochure covering the complete line. Includes information on properties and production techniques, and also suggests various applications. 270R Celanese Corp. of America

**Resins, Polyester.**..... Presents detailed information on a versatile family of liquid polyester resins, for laminating, impregnating, casting or molding. Included in literature are all valuable features. 270S Naugatuck Chem. Div.

**Resins, Polyvinyl Chloride.**..... Covers series of new polyvinyl chloride resins of unique versatility. Includes physical properties and performance characteristics in detailed Sales Service Bulletin No. 6. 270T Firestone Plastics Co.

**Resins, Polyvinyl Chloride.**..... Presents information on a high molecular weight polyvinyl chloride resin which can readily be dispersed in plasticizer to form a plastisol paste. Sales Service Bulletin No. 7. 270U Firestone Plastics Co.

**Resin Raw Materials.**..... Experimental product for applications where urea or melamine are now used. Covers data on suggested applications, properties, handling & storage, etc. Bulletin No. PD-B-1. 270V Allied Chem. & Dye Corp.

**Resins, Silicone.**..... Offers three data sheets containing descriptions of two types of silicone resins for foamed structures, typical properties of each & procedure for making foamed structures from these resins. 270W Dow Corning Corp.

**Resins, Synthetic.**..... Information on versatile synthetic resin... a favorite material in hundreds of industrial plants. Bulletin covers pertinent details concerning features, physical and chemical properties, etc. 270X Pennsylvania Indus. Chem.

**Resins, Vinsol.**..... Company presents a revised & enlarged technical booklet which illustrates how low-price Vinsol resin may be used to reduce the cost of phenol-formaldehyde resins. Details in 1954 Edition. 270Y Hercules Powder Co.

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**Ricinolates, Metallic.**..... Metallic ricinoleates as a class exhibit marked solubility in alcohols, ether alcohols and glycols. Company makes available valuable technical data—solubility information and property sheets. 270BB Baker Castor Oil Co.

**Salicylamide.**..... Summarizes important detailed pharmacological data on salicylamide—a highly effective analgesic & fever reducing drug. Includes properties in 26 p. booklet available on request. 270CC Heyden Chem. Corp.

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**Seed Protectants.**..... Seed decay and "damping-off" largely prevented by a very simple economical application of Spergon. Includes slurry and dry methods of seed treatment in Bulletin 4 and 5. 270EE Naugatuck Chem. Div.

**Seed Treatments.**..... Potentialities of peroxygen chemicals in seed treatment field outlined. Covers details on seed coat removal & disinfection, improvement of seed germination, etc. 8 p. Bulletin No. 33. 270FF Buffalo Electro-Chem. Co.

**Selectors, Agitator.**..... Manufacturer now makes available handy pocket sized, sturdy "Capaci-Dial" selector which automatically tells the best Pneumix agitator for each liquid batch mixing problem. 270GG Eclipse Air Brush Co.

**Sensitizers, Gel.**..... Efficient and economical gel sensitizer controls the rate of gelation of latex and enables it to gel more rapidly. Technical Bulletin fully covers use in latex foam. 270HH Armour Chem. Div.

**Sequesterants.**..... Complete information and technical data on TEAC-90, new type organic salt derived from selected acids & amines. Covers use as sequesterant, antioxidant, agricultural aid, etc. Bulletin No. 1-54. 270II Process Chem. Specialties

**Sequestering Agents.**..... Superior iron chelating properties overcome trace iron problems, in addition to sequestering calcium & other metal salts to degree never before attained. Description of process presented. 270JJ Refined Products Corp.

**Sequestrene.**..... Ethylenediamine tetracetic acid finding new applications in science & technology. Bibliography furnished which covers 1952 literature as well as earlier papers. Included are over 450 references. 270KK Alrose Chem. Co.

**Silica, Gel.**..... Refrigeration desiccant with greatly increased moisture adsorption capacity. Silica Gel reduces moisture level of Freon 12 to less than 10 ppm at temperatures as high as 160°F. Literature available. 270LL Davison Chem. Corp.

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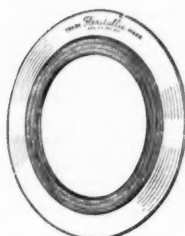
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Compression gauge type with outer ring. Style CG for raised face, smooth face, vanstone and lapped joint fittings. Style CG-RJ for ring-type joints. For all standard A.S.A. and A.P.I. fittings. Ring thickness:  $\frac{3}{8}$  inch.

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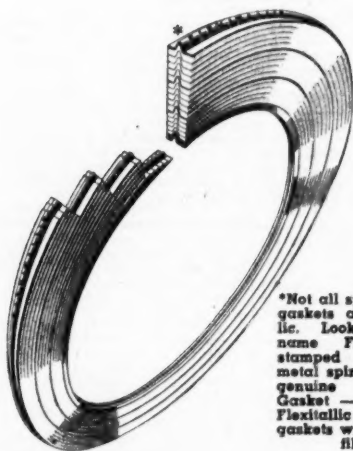
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**Silicon Carbide.**.....52 p. brochure describes properties of silicon carbide as related to varied applications & outlines manufacturing techniques. Relates its discovery and formation. Includes extensive bibliography.  
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**Silicone Products.**.....Provides information on semi-organic materials which cut production & maintenance costs. Increase life & performance & improve appearance of end products. Lists silicone fluids, resins, greases, etc.  
272C Dow Corning Corp.

**Silicone Release Agents.**.....These release agents are valuable aids in reducing number of rejected parts molded from numerous types of organic plastic resins. Includes information in Data Sheet 5-104.  
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**Silicone Release Agents.**.....Developed for shell molders who wish to use solvent-type agents rather than in water emulsions. Includes description, procedure for use, typical physical properties, etc. Data Sheet 5-106.  
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**Silicones.**.....New developments in silicones, plastics compounds, electrical insulating materials, industrial resins and varnishes, plastics laminating and molding. Booklet CDG-101. "GE Chemical Products."  
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**Soaps, Metallic.**.....Used in many industries: paint; lacquer & varnish; plastics; rubber; lubricant; etc. Complete data furnished in informative 32 p. book, "Metallic Soaps for Research & Industry."  
272G Metasap Chem. Co.

**Soaps & Synthetic Detergents.**.....New 1954 Handy Soap and Synthetic Detergent Buying Guide offers full resume of entire line of industrial products. Includes use, packaging data, new products, etc.  
272H Colgate-Palmolive Co.

**Soda, Caustic.**.....Manufacturer makes available illustrated 28 p. manual, "Caustic Soda—Unloading & Handling," which offers practical information on accepted safe practices in working with this chemical.  
272I Columbia-Southern Chem.

**Soda, Caustic.**.....Effectively standardize processing methods. Inspections and analyses safeguard uniformity of caustic. Offers Data Sheets and Bulletin 100 describing Hooker products and services.  
272J Hooker Electrochem. Co.

**Sodium Carboxymethylcellulose.**.....For solids suspending, film-forming, adhesive applications, etc. Data on water solubility, suspending power, adhesive and film-forming properties. Illustrated, attractive Bulletin.  
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**Sodium Fluoborate, Crystal, Technical.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-42401.  
259ab Baker & Adamson.

**Sodium Hexa-m-Phosphate.**.....Covers description, shipping & screen specifications, solubility, calcium sequestration, water softening requirements, applications, etc. in illustrated Technical Bulletin No. C-1001.  
272L Westvaco Chem. Div.

**Sodium Hydride.**.....Sodium hydride is a powerful drying agent for hydrocarbons, ether and amines. Fact sheet contains detailed data on its specific uses, preparation and properties. Can be obtained by request.  
272M Ethyl Corp.

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272N Virginia Smelting Co.

**Sodium Lauryl Sulfate.**.....Form of small extruded needles...eliminates sneezing & sniffing often encountered in a plant when working with a powder form. Has a greater bulk density. Technical data.  
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**Sodium Metal.**.....Data on procedures for handling sodium in solid, liquid or dispersion form. Tells how this highly reactive metal can be safely used in plant operations. Equipment needed precautions taken.  
272Q E. I. du Pont de Nemours.

**Sodium Phosphates.**.....Company offers easy-to-read data on sodium phosphates & other chemicals. Contains sections on classification, water softening, water fluoridation, plus useful tables, scales, etc.  
272R Blockson Chem. Co.

**Sodium Sesquisulfate.**.....Producer makes available technical information on properties & uses. Evaluations of sodium sesquisulfate with respect to basic detergent properties of wetting, emulsification, dirt suspension, etc.  
272S Phila. Quartz Co.

**Sodium m-Silicate, Anhydrous.**.....Valuable descriptions of anhydrous sodium m-Silicate—the economical detergent silicate—features greater chemical value and cost-saving advantages. File folder.  
272T Cowles Chem. Co.

**Sodium Sulfides.**.....Quick-dissolving sodium sulfides give clear solutions—entirely free of sediment—in only 15 minutes. Data Sheets available now. Bulletin No. 100 covers products & services.  
272U Hooker Electrochem. Co.

**Sodium Sulfonates.**.....Have become active components in a surprising variety of products. Data in technical bulletins, "Sodium Sulfonates. Refined (62%)" & "Shell Pale OS Sulfonates."  
272V Shell Chem. Corp.

**Sodium Trimethoxy Borohydride.**.....Most powerful selective reducing agent for certain functional groups where steric hindrance is present. Available immediately in pilot quantities. Provides Bulletin 504-C.  
272W Metal Hydrides.

**Sodium Tripolyphosphate.**.....New Bulletin features many uses: soap builder; manufacture of detergents & water softeners; anti-pitch agent in paper making; clay dispersant; etc. Technical Bulletin VI-52.  
143-6a Victor Chem. Wks.

**Sodium Tripolyphosphate.**.....Wet-process cement manufacturers find Victor sodium tripolyphosphate answers long-felt need. Can increase production 10% without adding new equipment. Technical Bulletin VI-53.  
272X Victor Chem. Wks.

**Solvents.**.....Manufacturer provides valuable information on Carbital solvent—typical physical properties, various specifications, shipping data, uses—available in new Technical Bulletin No. F-8291.  
272Z Carbide & Carbon Chem.

**Solvents, Lacquer.**.....Cellosolve acetate widely used in furniture & metal lacquers. Physical, chemical & physiological properties, applications, specifications, shipping data, etc. all included in Bulletin F-8296.  
272AA Carbide & Carbon Chem.

**Solvents, Petroleum.**.....Manufacturer makes available a buyers' guide to petroleum solvents and their properties. Lists aliphatic naphthas, para-finic hydrocarbons & aromatic hydrocarbons & solvents.  
272BB American Mineral Spirits.

**Solvents, Petroleum.**.....Feature high quality combined with uniformity & dependability...for your processing & chemical requirements. Complete information on specifications & characteristics.  
272CC Esso Standard Oil Co.

**Solvents & Plasticizers.**.....Presents a fully detailed book, prepared to give you a practical guide to the various outstanding characteristics of company line of solvents and plasticizers. Covers technical service.  
272DD Celanese Corp. of America.

**Sorbitol.**.....Sorbitol has dropped continually in price and now sells for less than ever. Booklet, "The Sorbitol Story," highlights the reasons why sorbitol is a better product at a lower price.  
272EE Atlas Powder Co.

**Sorbitol.**.....Product has increasing use in processed foods. Describes sorbitol's characteristics and functions in food preparations. Includes data on nutritive value and use in special dietary foods.  
272FF Atlas Powder Co.

**Sorbitol.**.....92 p. illustrated "Guide to Cosmetic & Pharmaceutical Formulations" with data on the use of sorbitol & Atlas surfactants in the preparation of drugs & cosmetics. Booklet available on request.  
272GG Atlas Powder Co.

**Sprays, Stock.**.....Effective combination of lindane and toxaphene.....controls ticks, mosquitoes, flies, lice on beef cattle, sheep, hogs, etc. Furnishes a livestock pocket guide and gestation chart.  
272HH California Spray-Chem.

**Stabilizers, Vinyl.**.....New lead compound developed for the stabilization of halogen containing organic materials. Covers information on uses, composition, appearance, solubility, etc. in Bulletin No. S-8.  
272II Witco Chem. Co.

**Stannous Chloride, Crystal, Technical.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-43421.  
259ac Baker & Adamson.

**Starches.**.....Producer presents 56 p. fully illustrated informative booklet, "The Story of Starches," includes valuable information concerning typical properties, production, possible applications & handling.  
272JJ National Starch Products.

**Starches, Textile.**.....Special purpose starches for textile industry. Complete description of types, uses & principal characteristics. Offers 26 special starches for warp sizing, finishing & printing. 6 p.  
272KK National Starch Products.



**Succinonitrile**.....Will undergo typical reactions of the nitrile group. Can be readily reduced in high yields to pyrrolidine. Refer to Succinonitrile Data Sheet for complete and detailed information.  
273A Monsanto Chem. Co.

**Sulfonate, Alkyl Aryl**.....Alkyl aryl sulfonate in spray-dried form, Sulframin HD Beads are blended with complex phosphates and organic chemicals for high detergency value. Complete data offered.  
273B Ultra Chem. Wks.

**Sulphur Dioxide**.....A versatile chemical reagent for industry, sulfur dioxide can be used as a reducing or bleaching agent, preservative, antichlor, neutralizer, pH control. Details in "Virginia SO<sub>2</sub>" Folder.  
273C Virginia Smelting Co.

**Sulphur Dioxide**.....Designed for processes requiring a superior reducing or bleaching agent, preservative, antichlor, pH control, or neutralizer. Provides samples, specifications and gives complete data.  
273D Tennessee Corp.

**Surface Active Agents**.....Surface active agents give water a thinner skin... like that of organic liquids. Description contained in Data Sheet entitled "Leak Testing with Aerosol OT." Manufacturers Chem. Dept.  
273E American Cyanamid Co.

**Surface Active Agents, Non-Ionic**.....Effective as dispersing, emulsifying and thickening agents. Information on specifications, oil solubility, thickening properties and applications. Technical Bulletin No. 211.  
273F Mona Industries

**Surfactant Selectors**.....For industrial chemists. Pocket-size dial-type selector offers emulsion formulators precise surfactant recommendation for 96 different & specific formulation problems. Includes full instructions.  
273G Atlas Powder Co.

**Surfactants**.....Wetting and penetrating qualities of surfactants prove to be highly advantageous in acidulating phosphate rock. Available in both liquid and granular powder. Descriptive Bulletin No. 56.  
273H Universal Detergents.

**Surfactants**.....Presents a detailed, 74 p. brochure entitled, "A Guide to Formulation of Industrial Emulsions with Atlas Surfactants," on how to choose and use surfactants for general industrial applications.  
273I Atlas Powder Co.

**Tackifiers**.....Offers data on Koresin, a highly regarded tackifier which is a tertiary butyl phenolacetylene condensation product. Includes properties, solubility, compatibility, suggested uses, etc.  
273J Antara Chem.

**Tackifiers, Resin Emulsion**.....Designed to produce fast-breaking (fast-setting) adhesives. Typical applications—side lasting & sock lining cements in shoe industry, carton adhesives, etc. Bulletin provides full information.  
273K American Resinous Chem.

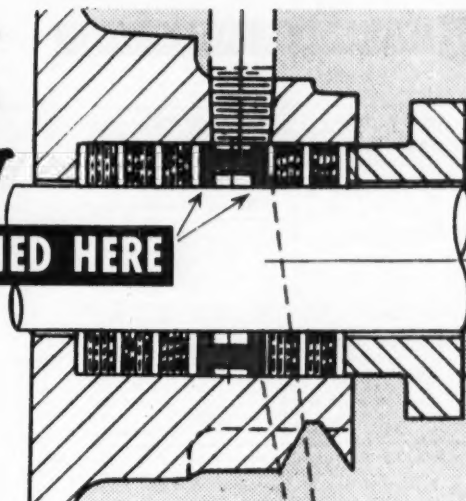
**Tetrachlorobenzenes, Isomeric**.....These compounds exhibit unique physical & biological properties that make them especially adaptable in specific industrial applications. Data in Product Development Bulletin No. CB-4.  
273L Solvay Process Div.

**Tetrahydro Phthalic Anhydride**.....Includes data on the properties and discusses the more important chemical reactions of the anhydride. Lists seven literature references. Technical Bulletin I-I.  
273M National Aniline Div.

**Tetrapotassium Pyrophosphate**.....Detailed examination of present & potential uses of TKPP in variety of industries. Data on properties, sequestration, etc., in Technical Bulletin 505 R.  
273N Westvaco Chem. Div.

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**Tetrine, Iron.**.....Iron Tetrine and related Ferralkine products cure and prevent agricultural crop iron deficiencies. Description of products and their uses is new Bulletin. "Iron Tetrine & Related Products."  
274A Glyco Products Co.

**Thiophosphoryl Chloride.**.....Manufacturer issues informative Technical Bulletin covering description, typical analysis, properties, suggested uses. Also includes typical reactions, toxicity, availability and storage.  
274B Westvaco Chem. Div.

**Trichlorobenzene.**.....Fact Sheet covers chemical & physical properties & suggests uses: dielectric fluid for electrical transformers; powerful soil poison for termite control; solvent for fats, oils, waxes, & resins; etc.  
274C Ethyl Corp.

**Trichlorobenzenes, Isomeric.**.....New release includes data on typical physical properties of the pure isomers; volatility, solubility, etc. Also gives various reactions; suggested uses. Product Development Bulletin CB-3.  
274D Solvay Process Div.

**Triethanolamine.**.....44 p. features latest information on physical properties, various specifications, possible uses and shipping data for triethanolamine and the other amines available. Booklet upon request.  
274E Carbide & Carbon Chem.

**Triethyl o-Formate.**.....A unique ester, closely resembling an acetal, stable in presence of alkali, unstable in presence of acid, & a source for the ethoxy methylene group. Details in Technical Bulletin.  
274F Kay-Fries Chem.

**Triethyl Thionophosphate.**.....For the research chemist. Data Sheet offered for this clear, colorless to straw-colored liquid. Contains information pertaining to molecular weight, formula, approximate properties, etc.  
274G Monsanto Chem. Co.

**Trifluoroacetic Anhydride.**.....New reagent for preparation of esters. Data on physical properties, esterification, nitration, corrosion, handling, safety, etc. Bibliography included. 6 p. Bulletin EC-1120-PC.  
274H Minnesota Mining & Mfg.

**Trimethylethane.**.....Highly valuable catalogue covers new uses of trimethylethane as a raw material in manufacture of alkyls, high-grade drying oils, plasticizers, surface active agents and fine chemicals.  
274I Heyden Chem. Corp.

**Trischloroethyl Phosphate.**.....Technical Data Sheet 8-16 covers description, typical analysis, properties, uses (known & potential) typical reactions, as well as handling precaution, toxicity, availability.  
274J Westvaco Chem. Div.

**Tungsten Ores.**.....Announces the availability of a new Brochure, which describes various methods of processing tungsten ores, particularly the froth flotation processes used on western U. S. ores.  
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**Urea, Crystal.**.....Laboratory pure crystal urea at process prices. Purity comparable to U.S.P.—in 100 lb. moisture-proof multiwall bags—in carload, truckload, L.C.L. quantities. Offers detailed Booklet.  
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274M Dow Corning Corp.

**Vermiculite Analysis.**.....Vermiculite's chemical & physical properties. Includes chemical composition, base exchange characteristics, solubility, water absorption, etc. Request Fact Sheet & tech. data manual.  
274N Zonolite Co.

**Vinyl Acetate Monomer.**.....Descriptive Folder includes pertinent data on the numerous industrial applications of the product—embracing the textile, adhesives, coatings, paper and soil conditioning fields.  
274O Celanese Corp. of America.

**Vinyl Compounds.**.....Describes unique combination of physical and chemical properties offered by Plastisol compounds. Used for coating, casting or molding. Offers full information in Bulletin VP-1.  
274P United Chromium.

**Vinyl Processing.**.....Data on lubricating action of A-C Polyethylene & comparison between this material & more common release agents now used in processing of vinyl sheeting & film. Available in company Bulletin.  
274Q Semet-Solvay Div.

**Vinyltoluene.**.....Manufacturer offers detailed 47 p. booklet, illustrated with many charts & graphs, organized in three sections representing the field of use of vinyltoluene in the paint vehicle industry.  
274K Dow Chem. Co.

**Viscosity.**.....For protective coatings. Description of viscosity of a new cellulose polymer compared to 5' R. S. nitrocellulose. Chart illustrating the comparison in a typical balanced solvents system is available.  
274S Eastman Chem. Products.

**Vitamin B.**.....Announces a new 24 p. Brochure containing recent nutritional and clinical information with a brief review of chronology, chemistry, pharmacy and occurrence of the vitamin in nature.  
274T Hoffman-La Roche.

**Waste Treatment.**.....Dry powder of preserved beneficial groups of microorganisms accelerates natural biological action. Decomposes specific types of wastes—refinery, paper, cannery and milk wastes. Used widely.  
274U Reliance Chem. Corp.

**Water Repellants.**.....Description of blends of waxes, textile resins, organic heavy metal compounds adaptable for use in dry cleaning industry. Covers properties, application, shipping. Data Sheet No. E-118.  
274V American Resinous Chem.

**Wax Emulsions.**.....Tables, drawings, typical test data for nine different wax emulsions in 16 p. Describer role of wax emulsions for specific paper sizing problems. Size press applications & formulas listed.  
274W Hercules Powder Co.

**Wax, High Melting Point.**.....Manufacturer's literature describes fatty amide high melting point wax used to onadify shampoos, raise the melting point of glyceride & paraffin oils, etc. in new Technical Bulletin No. 40.  
274X Emulsol Corp.

**Waxes, Microcrystalline.**.....Company makes available fully detailed information on microcrystalline and synthetic waxes. In various technical booklets, bulletins and price lists. Can be obtained on request.  
274Y Petrolite Corp.

**Wetting Agents.**.....Many possible uses include laundering, paper rewetting, industrial cleaning compounds, detergent sanitizers and textile processing. Chemical company offers details in Sterox AJ Bulletin No. P-147.  
274Z Monsanto Chem. Co.

**Wetting Agents.**.....If you require the basic raw material, wetting agents in intermediate form or finished product... company offers highest quality & uniformity. Technical Bulletins give pertinent information.  
274AA Oronite Chem. Co.

**Wetting Agents.**.....Full descriptions of results of recently completed tests & experiments of wetting agent, Udet F, conducted by prominent fertilizer manufacturers are now available in Bulletin No. 57.  
274BB Universal Detergents.

**Xanthine Compounds.**.....New literature provides latest data on xanthine, hypoxanthine & sodium xanthine. Covers typical physical & chemical properties & applications in biochemistry & medicine. Bulletin 114a.  
274CC Schwarz Labs.

**Zinc Formate, Crystal, Purified.**.....Makes available an informative Data Sheet which covers pertinent details concerning physical and chemical properties, suggested uses, containers, etc. No. DA-4441.  
274D Baker & Adamson.

**Zirconia, Stabilized.**.....Finds successful usage in refractory, ceramic, electrical & abrasive fields. Pertinent information on chemical & physical properties & proven & suggested uses in new descriptive Folder.  
274DD Zirconium Corp. of Amer.

## Process Equipment

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274EE National Carbon Co.

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274FF Falls Industries.

**Anodes, Plating.**.....Describes copper, lead, zinc, tin, tin-lead, cadmium, sodium oxide & brass plating anodes. Data available on sizes, shapes, compositions & other characteristics. Bulletin 141.  
274GG Amer. Smelting & Refg.

**Autoclaves, High Pressure.**.....Furnish numerous operating advantages: no stuffing box; magnetically operated agitator; positive agitation; adjustable timer to vary agitation cycle; etc. Bulletin 1051.  
274HH Autoclave Engrs.

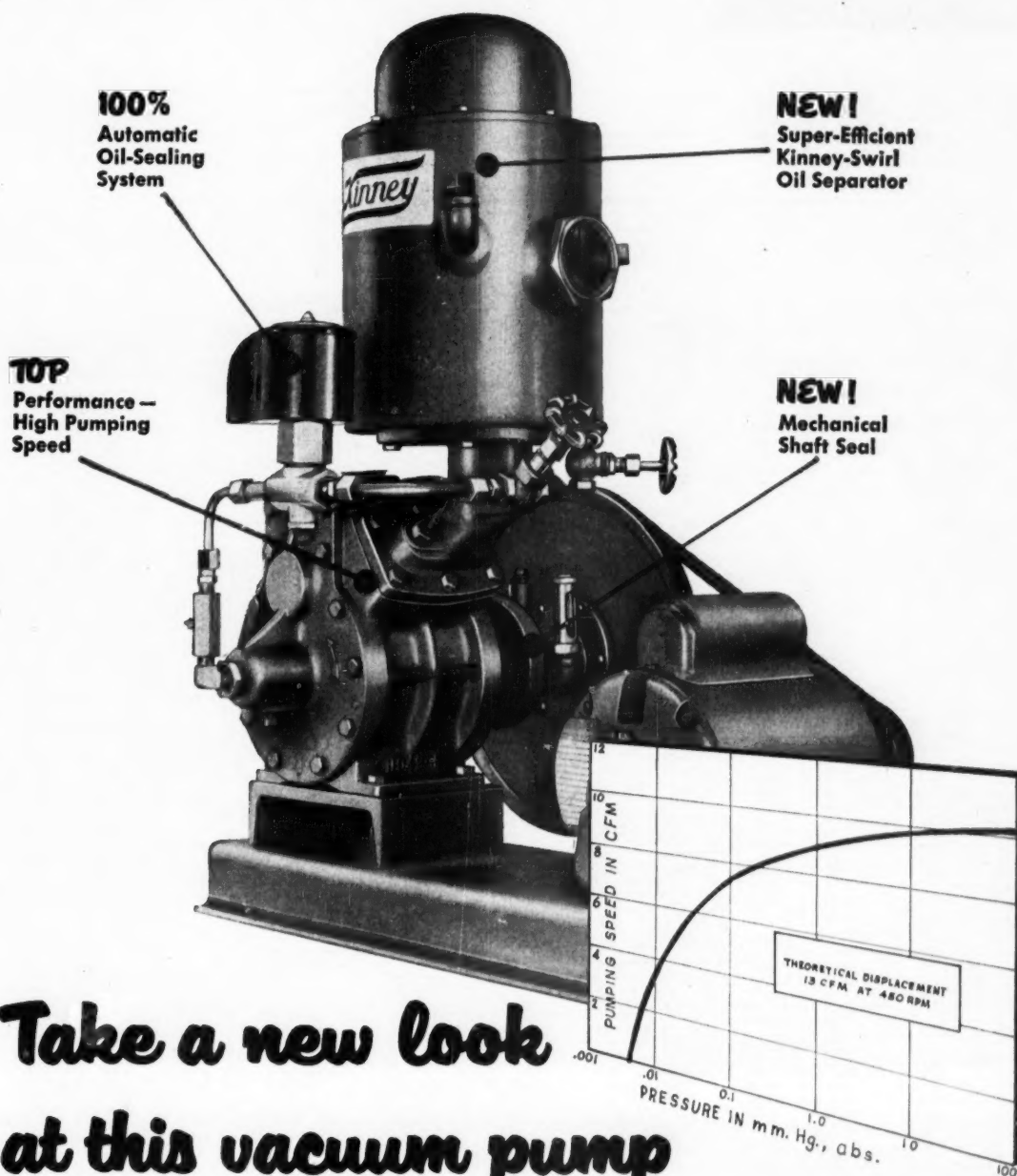
**Autoclave-Reactors.**.....Makes available engineering knowledge, fabricating skill, facilities... for greater reliability. In any capacity, for any pressure, temperature or reaction. Full information in Catalog 2413.  
274II Blaw-Knox Co.

**Blast Cleaning Equipment.**.....28 pages on accessories and supplies available for use with blast cleaning equipment. Accessories include: helmets, gloves, hoses, nozzles, aprons, and others. Bulletin 300C.  
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274KK J. H. Day Co.

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**Blenders, Twin Shell.....**More thorough blending in fraction of the time previously taken. One blender replaces methods which required a separate drum for every mix. Offers detailed Catalog 12.  
276A Patterson-Kelly Co.

**Boiler Feed Water.....**Up-to-date information for process plants on the problems of water softening, demineralization, dealkalizing, silica removal, hot zeolite and chemical softeners. 20 pages. Bulletin BFT-11.  
276B Hungerford & Terry.

**Brush Strips.....**Adaptable to many applications, can be coiled or twisted into various shapes. Can be formed to give intermittent or continuous brushing action. Adapt to stationary or power driven applications.  
276C Fuller Brush Co.

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276E Pressed Steel Co.

**Centrifugals.....**Automatic electric drive centrifugals designed for efficient, economical operation. 48" x 30" basket—1200 R.P.M. Manufacturer's Catalog cites features and describes other basic models.  
276F Western States Mach. Co.

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276G American Tool & Mach. Co.

**Centrifuges.....**Controlled concentration of solids from slurries is function which nozzle-type centrifuges perform with the highest efficiency. Description & applications offered in Bulletin No. 1253.  
276H Sharples Corp.

**Centrifuges.....**Offer advantages with regard to many important factors: initial expense and maintenance costs; production capacity; ease of cleaning; versatility; etc. Descriptive data in Booklet 6-RC-3.  
276I Heyl & Patterson.

**Centrifuges.....**Offers proven means of continuously handling slurries with highest operating economy and wide variation in solids concentration (Bulletin 1254). For pilot plant use (Bulletin 1275).  
276J Sharples Corp.

**Centrifuges.....**Illustrated bulletin on push & scraper type centrifuges offers comprehensive information on range of application, methods of control, simplicity of design and economy of operation.  
276K Cleaver-Brooks Co.

**Centrifuges.....**Gives detailed information about centrifuges including list of prices, production, square feet of filtering surface, construction, weight, maintenance, etc. Booklet 4-RC-3 on request.  
276L Heyl & Patterson.

**Centrifuges.....**Tubular bowl centrifuges with advantage of full flow stream design which assures continuous maximum efficiency & throughput. Removal of solids is accomplished easily and quickly. Bulletin 1248.  
276M Sharples Corp.

**Centrifuges.....**Centrifuges featuring the advantages of a deeper bowl... which leads to greater filtering area and, therefore, increased production. Application data contained in Booklet No. 6-RC-3.  
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**Chasers.....**Chasers (mullers, mixers, edgerunners, etc.) are extremely sturdy in construction, and improvements in design over a period of years have resulted in equipment requiring minimum of maintenance.  
276O Vulcan Iron Wks.

**Chemical Equipment.....**Data on a wide range of types and sizes of acid and alkali-proof chemical equipment. Includes pipe, ductwork, tanks, kettles, jars, filters, towers and many other items. Bulletin No. 11.  
276P Maurice A. Knight.

**Clarifiers.....**Offer continuous, economical operation, more efficient removal of suspended matter from solution, minimum of operating supervision more trouble-free maintenance. Details in illustrated bulletin.  
276Q Graver Tank & Mfg. Co.

**Clarifiers.....**Solve water treatment problems in minimum space at lower cost. Provide water supply in fraction of space needed by other types. Details in Accelerator Bulletin 1825-K.  
276R Inflico, Inc.

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276S Dorr Co. Engrs.

**Classifiers, Air.....**For application in continuous separation of coarse and fine air-borne particles. Information covers operational details and advantages over conventional types. Illustrated Bulletin AH-149.  
276T Hardinge Co.

**Classifiers, Air.....**Gyrotor air classifier designed for applications where close control of products is required. It features a wide range of fineness, controlled by simply changing the rotor speed. Bulletin AH-149-11.  
276U Hardinge Co.

**Cleaners.....**Describes new heavy duty cleaner for wet or dry-pickup. Specifications and illustrations of the tank and various tool kits designed for specialized cleaning jobs are included in the literature.  
276V Premiere Co.

**Cleaning Equipment, Gas.....**Shows use of electrostatic precipitators for high dust collection efficiencies in cleaning open hearth stack gases at normal costs. Advantages discussed in illustrated Bulletin OH.  
276W Research Corp.

**Cleaning Systems, Vacuum.....**Analyzes costly, wasteful problem of industrial dust and describes complete line of vacuum cleaning equipment designed to combat it. Details on features and advantages. Bulletin A-939.  
276X U. S. Hoffman Machy.

**Collectors.....**Presents solution for efficient removal of air-borne contamination (dust, fumes, vapors, acid gases and odors) and recovery of product thru multiple washing action. Bulletins 610 & 551.  
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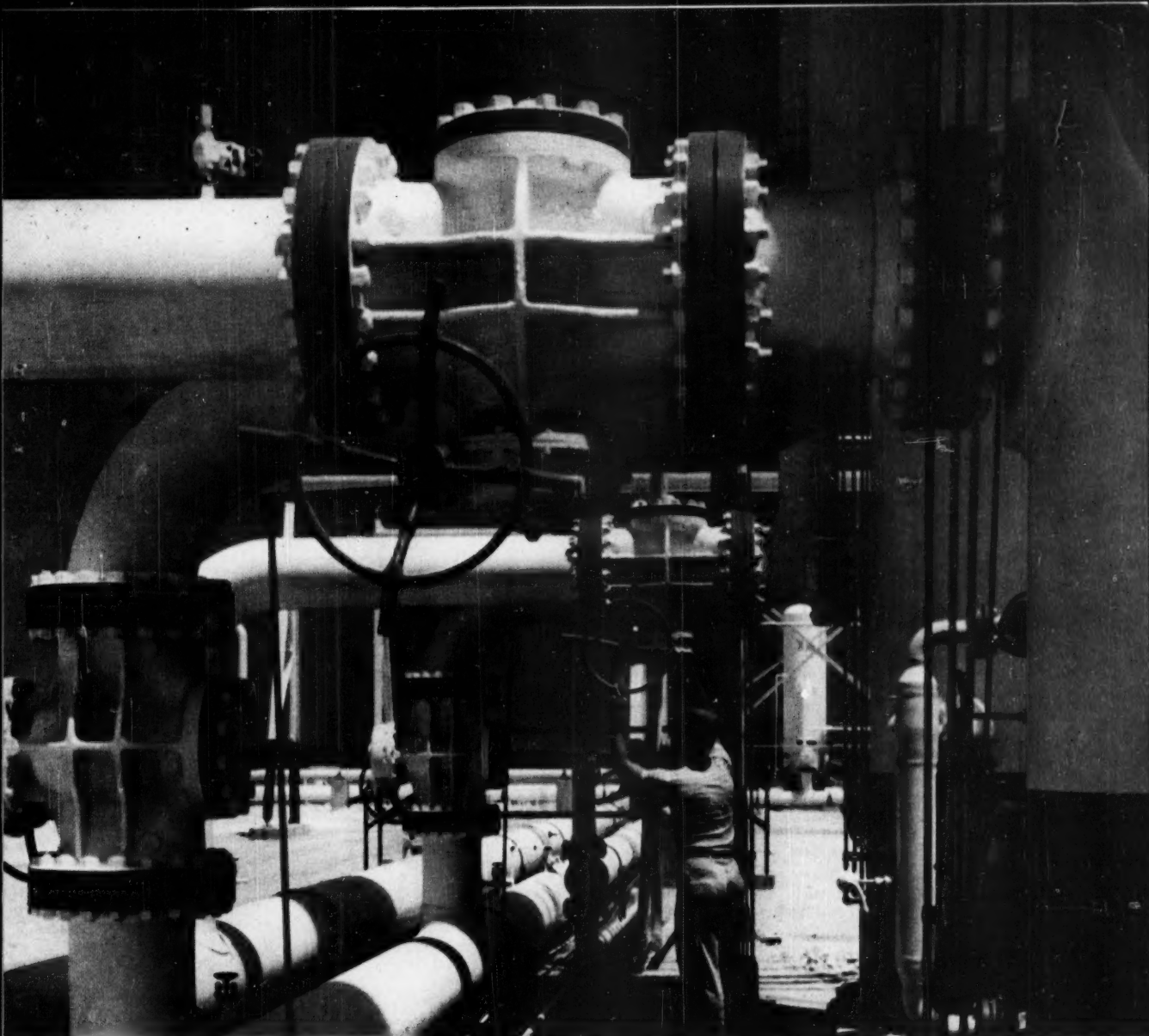
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*Certainly... no question the valve will operate when it's needed if it's a Rockwell-Nordstrom. It isn't necessary to experiment with valves—Rockwell has done the research for you. The originator of lubricant-sealed valves, with more valves in more different services than any manufacturer, Rockwell can fit the proper valves and lubricants to your application.*

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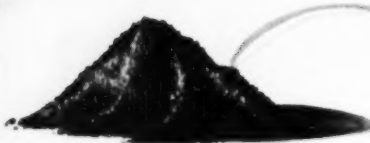
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## HOW TO END SLURRY WORRY

Slurries and entrained solids eat the heart right out of many types of valves—and incidentally eat up process industry profits at the same time.

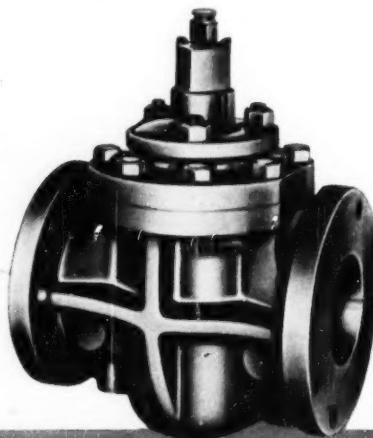
The point is that all solids are essentially abrasive, gritty, erosive.

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279A Pennsylvania Crusher Co.

**Crushers, Jaw.**.....Company line of jaw crushers offers construction features such as steel frames, anti-friction bearings, manganese steel liners. Size: 5' x 6" to 32' x 40". Complete details in technical bulletin.  
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279G Oliver United Filters.

**Dehumidifier-Filter.**.....Offers brochure, "Moisture Control in Compressed Air," which discusses various classifications and quantities of impurities and methods for their removal. Advantages of VI-Speed method outlined.  
279H Van Products Co.

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279I Sharples Corp.

**Deminerallizers.**.....Company's new line of mixed-bed water deminerallizers features latest engineering developments, resulting in an improved ion-exchange process of water purification. Bulletin 126.  
279J Barnstead Still & Sterilizer.

**Deminerallizers.**.....Variety of mono- and multi-column deminerallizers (flow rates from 10 to 10,000 gph). Equipped with regenerant tanks and necessary gages, flow meter and conductivity meter. Descriptive Catalog.  
279K Fenfield Mfg. Co.

**Deminerallizers.**.....Describes eight different processes of deminerallization including Un-A-Bed one tank deminerallizer and silica and carbon dioxide removal by ion exchange. Bulletin DM on request.  
279L Hungerford & Terry.

**Deminerallizers.**.....Covers mixed-bed, two-bed and four-bed deminerallizers for laboratory, hospital and industrial use. Explains engineering principles, construction, operation. 20 p. illustrated Catalog 127.  
279M Barnstead Still & Sterilizer.

**Deminerallizers, Cartridge.**.....Low cost, mineral-free water in quantities up to 10 gal./hr. Operation is simple & fool-proof & maintenance is low. Describes advantages of flow meter. Permanent cartridge Deminerallizer brochure.  
279N Fenfield Mfg. Co.

**Deminerallizing.**.....Explains principles of ion exchange. Literature goes into the applications of anion and cation exchange materials. Design and operations of deminerallizer systems. 39 p. Bulletin 5800.  
279O Cochrane Corp.

**Demisters.**.....Provides simple means to improve performance & increase capacities of process equipment handling vapor & liquid materials. Clean separation. Advantages & engineering data in Catalog 13.  
279P Otto H. York Co.

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279Q Falls Industries.

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279U Cowles Co.

**Distillation.**.....Presentation of technical data on custom-engineered columns, exchangers, reboilers, auxiliaries and controls for use in distillation operations. In illustrated booklet released by manufacturer.  
279V Colonial Iron Wks. Co.

**Dryers.**.....Help solve problems of drying air or other gases. Offer valuable advantages: simplicity of operation and maintenance; low installation cost and minimum maintenance expense. Details in Bulletin D-29.  
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279Z Davenport Mach. & Foundry.

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279AA Denver Equipment Co.

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279BB Hardinge Co.

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279CC Proctor & Schwartz.

**Dryers.**.....Literature gives full information on the Turbo-Dryer. Advantage is to be found in gentle handling through repeated piling and spreading for granules, powders, crystals, sludges, slurries.  
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279FF Link-Belt Co.

**Dryers, Roto-Louvre.**.....Drum design provides aerated mass drying. Will not damage heat-sensitive materials. Gradual, positive heat transfer prevents case-hardening. Special features discussed in Book 1911-B.  
279GG Link-Belt Co.

**Dryers, Spray.**.....Deliver powder which is homogeneous, highly soluble, sized to specification, and in the form of particles or dust-free hollow beads. Even slurries can be handled advantageously. Fully illustrated.  
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**Dryers, Vacuum.**.....Major improvements in dryer design and construction . . . provide faster, finer, cleaner operation at top efficiency. Descriptive literature covers many features and advantages.  
279HH Patterson Foundry & Mach.

**Dryers, Vacuum Chamber.**.....Designed to handle drying of a wide variety of materials which can be spread on trays or pans. Covers application, operation, types and sizes available, etc. Illustrated.  
279II J. P. Devine Mfg. Co.

**Drying Systems, Flash.**.....Systems offer means for handling materials in which drying is combined with pulverizing, or with mild disintegration, or followed by cooling and conveying the product to storage. Catalog 54-A.  
279JJ Raymond Div.

**Drying Vacuum.**.....Offers informative brochure, "Vacuum Drying," which contains descriptions of the techniques of moisture removal from chemicals, pharmaceuticals and other industrial products.  
279KK F. J. Stokes Mach. Co.

**Dust Collectors.**.....Offer high dust collection efficiency, economical operation, dependable performance, economy of space required for installation. Details presented in descriptive 28 page catalog.  
279LL American Wheelabrator.

**Dust Collectors.**.....Presents information on hydro-static precipitators for use in rotary kiln service. Equipment offers high collection efficiency on even small micron particle sizes. Details in Bulletin No. 277.  
279M American Air Filter Co.





**Dust Collectors.**.....Offers description of dust control method and its advantages. Outstanding reclamation savings result from effective trapping of chemical dusts. Maintenance costs kept at minimum. Bulletin 909-A.  
280A Pangborn Corp.

**Dust Collectors.**.....Collecting cast iron dust with Dustkop collectors illustrated & described. Analyzes problem of recovery and describes necessary procedure for selecting & installing equipment, etc. Bulletin 640 #21.  
280H Agat-Detroit Co.

**Dust Collectors.**.....Discusses the problem of dust collection in both food and processing industries and describes advantages of company line of dust collectors. 8 page illustrated Bulletin No. 171.  
280C Green Fuel Economizer Co.

**Dust Collectors.**.....Dry centrifugal collectors designed to handle large exhaust volumes containing dry, granular dust in large concentrations. Offer numerous valuable advantages. Full details in Bulletin 291.  
280e American Air Filter Co.

**Dust Collectors.**.....For the effective removal of nuisance and toxic dusts raised during hopper loading or in other instances where handling or feeding of dry chemicals creates this problem. Offer Publication TP-2-M.  
280D Wallace & Tiernan Co.

**Dust Collectors.**.....Information on means of controlling dust in the manufacture of paint. Provides case histories of successful solutions of this problem among four different companies. Illustrated Bulletin 422.  
280E American Wheelabrator.

**Dust Collectors.**.....Equipment solves problems posed by dust of all different types, fly ash, chemical fumes, gases of any temperature, aerosols & other troublesome air pollutants. Information contained in Catalog A-653.  
280F R. C. Mahon Co.

**Dust Collectors.**.....Featuring cabinet & cyclone types. Illustrates adaptability to meet specific dust collecting problems. Selection data, sketches, specification charts giving over-all dimensions. 16 p. catalog issued.  
280G Torit Mfg. Co.

**Dust Collectors.**.....Company's line of wet-type dust collectors offer high efficiency of collection, dependable, trouble free performance, minimum of maintenance, low pressure drop, low initial cost. Bulletin 531.  
280H Dust Suppression & Engrg.

**Dust Collectors.**.....Remove nuisance, toxic and hazardous dust...thereby reducing equipment maintenance, increasing productivity, improving quality of product, safeguarding workers' health, etc. Illustrated booklet.  
280I A. W. Banister Co.

**Dust Collectors.**.....Reverse jet fabric type applicable in situations where extremely fine particles are involved or where it is necessary to collect material in dry state for reclaiming. Bulletin 279.  
280b American Air Filter Co.

**Dust Collectors.**.....Reverse-jet dust collector provides many features: cleans as it filters—without interruption to operations; maintains filter porosity; prolongs filter life; etc. Provides complete information.  
280J Western Precipitation Corp.

**Dust Collectors, Cloth Bag.**.....Provides information on how dust control for all types of finely divided dry dusts can be obtained for smaller volume applications at low equipment and installation costs. Bulletin 916.  
280K Pangborn Corp.

**Dust Control.**.....Analyzes of how dust control equipment solves the problem of recovering valuable dusts—or controlling harmful dusts. Makes available Bulletin covering complete technical information. No. 806.  
280L Dracoo Corp.

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**Dust Control.**.....Valuable data relating to scope of dust pollution problem and also collection equipment requirements are made available in new manual. "A Simplified Test Method for Dust Control Determination."  
280M Dustex Corp.

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280N Mechanical Industries.

**Dust Control.**.....Describes method of controlling dust in the manufacturing of asbestos products. Demonstrates how cloth-tube-type dust collectors are used to ventilate dust producing machines. Illustrated Bulletin 412.  
280O American Wheelabrator.

**Dust Control.**.....Covers special equipment engineered to solve individual problems posed by dusts of all kinds in addition to fly ash, chemical fumes, gases of any temperature, aerosols, etc., in Catalog A-654.  
280P R. C. Mahon Co.

**Dust Filters.**.....Aeroturn (Series "12") is the best answer for high efficiency large volume dust filtering with automatic reverse-air-jet filter cleaning. Capacities up to 60,000 cfm. Data in Bulletin 102A.  
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**Dust Filters.**.....Flat bag dust filters which may be used for effective industrial dust control in all of the process operations. Manufacturer issues pertinent information, contained in Bulletin No. 98.  
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**Dust Filters.**.....Aeroturn (Model "D") is the most compact high efficiency dust filter available. Complete, factory-assembled, package units... in capacities from 500 to 7200 cfm. Descriptive Bulletin 302A.  
280b Turner & Haws Engrg. Co.

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280Y Buřlovak Equipment Div.

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280AA Sharples Corp.

**Extractors, Mix-&Settle.**.....These extractors find application in the petroleum, pharmaceutical, chemical, petrochemical and fine chemical industries. Includes design principles, operation, features, cross sections, photos, etc.  
280BB National Research Corp.

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# NICHOLSON TRAPS

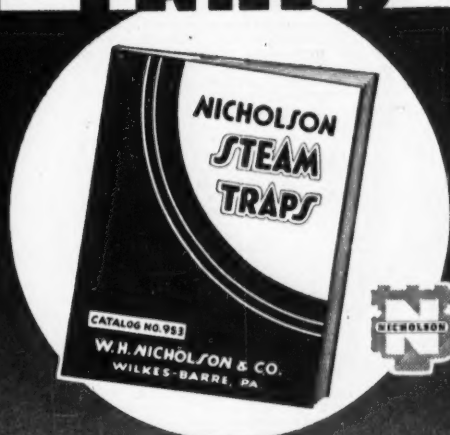
Can Help You Solve  
Any Drainage Problem

**32-Page Reference Describes Advanced-Type  
Trapping Methods for Process Industries**

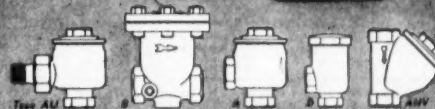
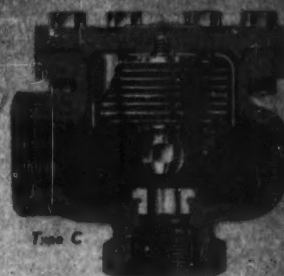
Nicholson furnishes a type and model of trap for every industrial process, power and heat application. For complete details you are invited to send for the helpful 32-page reference pictured above.

## NICHOLSON THERMOSTATIC BELLOWS STEAM TRAPS

Nicholson thermostatic bellows steam traps (at right), distinguished for their fast positive action, are suited for critical processing applications. They are widely specified for continuous production and where advanced-type quality controls are in use, due to the high even temperatures Nicholson units effect and their minimum maintenance time and costs. Other advantages: above-average drainage capacity; will not freeze in operation. Specify the trap in the proper size to fit piping requirements: in 0 to 200 lb. range use type A, D, AU or AHV; to 250 lbs., use type B or C in semi-steel construction; to 300 lbs., use type C in cast steel construction. Bellows of bronze, monel or stainless.



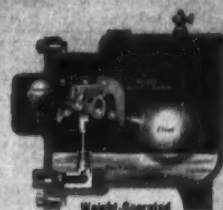
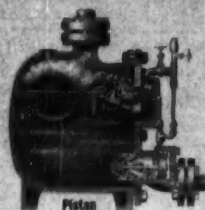
A type for every Process, Heat and Power need. For pressures from 0 to 300 lbs.



## PISTON OR WEIGHT-OPERATED TRAPS

Nicholson piston-operated steam traps (right) have large capacity and are recommended wherever water is in volume; e.g., steam purifiers. Pressures: 2 to 650 lbs. Capacities: 12,500 to 552,000 lbs. Sizes: 1 1/4" to 2 1/2".

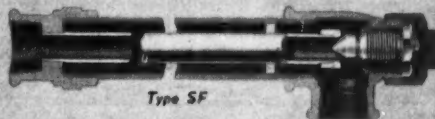
Nicholson weight-operated traps are heavy-duty types for draining steam, air and gasoline from separators, process vessels, dry kilns, accumulators, intercoolers, etc. Pressures: 23 ranges, 0 to 1500 lbs. Capacities: 1295 to 11,700 lbs. Sizes: 1/2" to 2"



## THERMOSTATIC METAL EXPANSION STEAM TRAPS

Nicholson expansion steam traps (right) require extremely low maintenance. Because they are readily adjusted to pass condensate at any point below 212°F, processing and refining plants have adopted these traps as low-cost temperature regulators on storage tanks which must be maintained at certain temperatures. Freeze-proof. Pressures: 0 to 250 lbs. Sizes: eight, 1/4" to 2".

**RADIATOR TRAPS** -- Thermostatic bellows type for vapor and vacuum heating systems under 25 psi.



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## NICHOLSON WELDED FLOATS

Standard with hundreds of manufacturers. Light and heavy-duty types. For mechanisms or as vessels; 2" to 14" diam. In stainless, monel or plated steel.





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282A Elmco Corp.

**Filters, . . . . .** For flows between 1.8 GPM & 900 GPM. Graded density cartridge featured. Applications, dimensions, case histories, selector chart, hydraulic data. 12 p. Illustrated. Bulletin MK-0553.  
282H Cuno Engrg. Corp.

**Filters, . . . . .** Describes full line of industrial Auto-Klean filters. Includes data on principles, construction, operation, advantages, specifications, capacities, applications, case studies, etc. Catalog AK-050.  
282C Cuno Eng. Corp.

**Filters, . . . . .** Built for pyrogen and bacterial retentive work and valuable for filtration of perfumes, essential oils, drugs, pharmaceuticals, chemicals, etc. Also model for smaller capacity. Bulletins 8-ESS & 8-4 EL.  
282D Ertel Engrg. Corp.

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282E American Air Filter Co.

**Filters, Automatic, . . . . .** Designed to handle large air volumes with high efficiency performance. Includes features, specifications, engineering and application information in illustrated, 12 page Bulletin 500.  
282F Dollinger Corp.

**Filters, Catalyst, . . . . .** Catalysts replace cyclones and electrostatic precipitators and offer such advantages as: complete catalyst retention; high temperature service; low pressure drop; low maintenance. Bulletin 80C.  
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282H Hungerford & Terry.

**Filters, Continuous Vacuum, . . . . .** Makes available valuable information on continuous vacuum filters and dryers for utilization in the chemical and metallurgical process industries. Technical data in illustrated Bulletin F2012.  
282I Elmco Corp.

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282J American Air Filter Co.

**Filters, Dewatering, . . . . .** Presents information on a new and radically designed dewatering filter. Literature covers complete operating details, applications, advantages, etc., in illustrated Bulletin AH-450.  
282K Harding Co.

**Filters, Diatomite, . . . . .** Demonstrates how filtration of water or other liquids for industrial use can be obtained simply and efficiently by the utilization of diatomite filters. Bulletin WC-115 gives details.  
282L Graver Water Conditioning.

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282O Purolator Products.

**Filters, Pressure, . . . . .** Feature initial low cost, low element cost, no flow restrictions, internal pressure backwashing. Includes information on design and applications in illustrated Bulletin No. F2031.  
282P Elmco Corp.

**Filters, Pressure Leaf, . . . . .** Presents the Hercules "Fact Finder"—embodying combined experience of plant & field filtration engineers over three decades of work with hundreds of America's leading manufacturers.  
282a Hercules Filter Corp.

**Filters, Pressure Leaf, . . . . .** Pressure leaf filter may be used for flow rates two to five times greater than cloth covered presses; positive removal of all suspended solids to desired degree of clarity; etc. Catalog NC-1-53.  
282Q Niagara Filters Div.

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282R Filtration Engrs.

**Filters, Sand, . . . . .** Filter cleans itself—automatically—with no interruption to the filtering operation. Keep shut-down time to a minimum. May be used for plant supply water or waste water treating. Bulletin 46-A-11.  
282S Hardinge Co.

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283D Hardinge Co.

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283M Paul O. Abbe.

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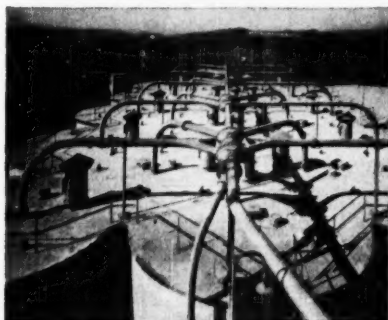
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- Mills, Grinding.**.....Pulva-Sizers feature dustless operation, ultra fine grinding, easy cleaning, durability, compactness, and other advantages. Company booklet also contains data on Com-Bin feeders. Illustrated. 284A Pulva Corp.
- Mills, Grinding.**.....Mills applicable for wet or dry, coarse or fine grinding. Assures a uniform product of desired fineness. Improved design and construction features are described in Bulletin No. 8121. 284B Traylor Engrg. & Mfg. Co.
- Mills, Grinding.**.....Dry, grind, classify—in a single system—materials carrying an appreciable amount of surface moisture, reducing them to dry, finely-ground products. Offers details in company Bulletin 17-B-11. 284C Hardinge Co.
- Mills, Hammer.**.....Offer instant screen change, simplified, heavy steel construction, ten-surfaced adjustable hammers, built-in crusher-feeder, and other features. Details found in Bulletin No. 1153-S. 284D Schutte Pulverizer Co.
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- Porous Mediums.**.....Bulletin contains typical applications: filtering water or solvents; cutting oils, wine & other liquids; reclaiming cleaning fluids; handling industrial oil wastes; etc. Bulletin No. 140. 284U Norton Co.
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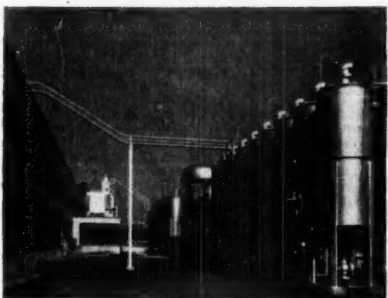
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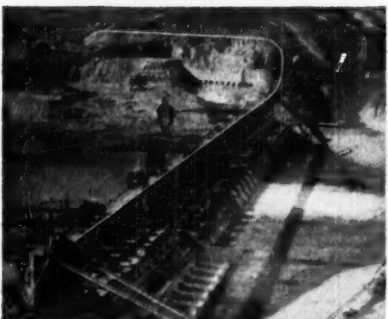
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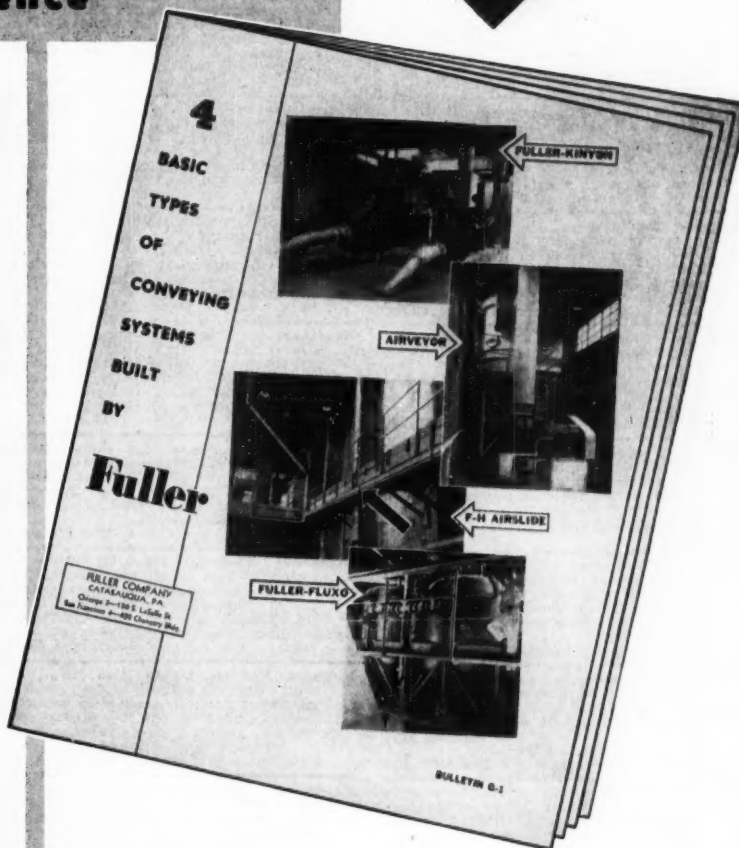
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G-98  
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286A F. J. Stokes Mach. Co.

**Presses, Tableting.....** Single punch & rotary tableting presses used for compacting pharmaceuticals, powder metals, plastic preforms, etc. Describes applications & mechanical design. 21 p. Catalog 801.  
286B F. J. Stokes Mach. Co.

**Process Equipment.....** Company supplies pertinent data describing packaged steam generators, cooling towers, heat exchange & absorption equipment, waste heat boilers & water heaters, high vacuum equipment, etc.  
53g Foster Wheeler Corp.

**Process Equipment.....** Brochure includes complete data on equipment for the process industries. Covers primary & secondary gyratory crushers, jaw crushers as well as apron feeders, ball mills, etc. 8 p.  
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329a Hardinge Co.

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286D Colonial Iron Wks. Co.

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286E J. P. Devine Mfg. Co.

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167a Industrial Filter & Pump.

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286L Raymond Div.

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286M Schutz-O'Neill Co.

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287D Illinois Water-Treatment.

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287E Cochrane Corp.

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287J V. D. Anderson Co.

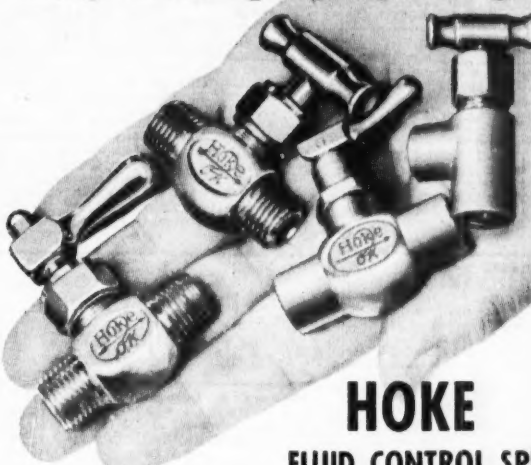
**Strainers**.....12 p. with descriptions, illustrations, diagrams, engineering data. Removes fine suspended particles from raw or process water, oil, gasoline, etc. The numerous advantages are fully described.  
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**Strainers, Fine Screen**.....Stop rust, scale, dirt from clogging mechanical equipment. Screens of woven Monel wire, bodies & screen caps cadmium plated. In 10 sizes— $\frac{1}{8}$ " to 3". Data in illustrated Bulletin No. S-203.  
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288D Central Scientific Co.

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288E Vacuum Forming Corp.

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288G Alloy Fabricators, Div.

**Vessels, Pressure, Welded.**.....Tells most important factors to consider before purchasing any tanks, valves, etc. Gives blueprints & specifications. Data on manufacturing techniques—what they mean to the buyer.  
288H A. C. F. Industries

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288I Maurice A. Knight.

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288J U. S. Stoneware Co.

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288L Norton Co.

**Wire Cloth.**.....Makes wire cloth & filter cloth in all meshes & metals; filter leaves & screens, discs, strainers, baskets, semi- and complete apparatus to suit any requirements. Offers details in Catalog 50.  
288M Multi-Metal Wire Cloth.

**Wire Cloth.**.....84 p. catalog describes company's facilities for fabricating wire cloth parts. Includes information on the line of wire cloth parts for screening, filtering & special uses. Useful metallurgical data.  
288N Cambridge Wire Cloth Co.

**Wire Cloth.**.....Manufacturer makes available wire cloth accurately woven from all commercially used metals in sizes ranging from 4 inches (space cloth) to 400 mesh. Details on company line in new Catalog E.  
288O Newark Wire Cloth Co.

## Pumps, Blowers, Compressors

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288P Sawyer Bailey Corp.

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**Blowers Vaneaxial.**.....Valuable reference includes dimension drawings, figures and air delivery tables cover direct-drive vaneaxial blowers, three types of belt-drive vaneaxial blowers, etc. Bulletin A-110 offered.  
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288S F. J. Stokes Mach. Co.

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288T Nash Engrg. Co.

**Compressors.**.....Small, compact compressors feature 15 to 125 hp; 81 to 641 cfm; pressures to 125 psi, standard. (High pressure units to 250 psi); force-feed lubrication; etc. Bulletin No. A-56 contains descriptions.  
288U Joy Mfg. Co.

**Compressors.**.....Releases a new, fully illustrated, 36 p. bulletin, which contains complete information on the construction and operation of heavy-duty air compressors for industry. Bulletin No. A-72.  
288V Joy Mfg. Co.

**Compressors.**.....44 p. on how & why compressors assure trouble-free performance at minimum operating cost. Data on design, motor & drives, lubrication, cylinders, and specifications of installations, etc. Bulletin M-70.  
288W Cooper-Bessemer Corp.

**Compressors.**.....Engineered for continuous, heavy-duty usage—assure complete dependability with low operating cost. Require minimum attention & upkeep. Complete explanation included in Bulletin No. 726.  
288X Chicago Pneumatic Tool.

**Compressors.**.....Illustrated bulletin & technical information with charts & specifications on turbo-compression of air, gases & vapors. Gives capacities for all practical requirements. Available on request.  
288Y Cleaver-Brooks Co.

**Compressors.**.....Compressors built to individual specifications & range from single stage to 5 & 6 stages with pressures up to 25,000 lbs. Assure efficient, trouble-free operation. Detailed Catalog offered by company.  
288Z Norwalk Co.

**Compressors, Centrifugal.**.....Offers a complete line of centrifugals for gas compression and refrigeration—up to 10,000 horsepower in a single unit. Data in "Centrifugal Compressors for Industry."  
288AA Carrier Corp.

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288BB Sawyer Bailey Corp.

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288CC American Blower Corp.

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288DD Sawyer Bailey Corp.

**Compressors, Centrifugal Recycle.**.....Offer many advantages: smaller physical dimensions; oil free compression; sturdy construction; high efficiencies; low capital investment; low maintenance; etc. Brochure offered.  
288EE Sawyer Bailey Corp.

**Compressors, Cylinder.**.....Eliminate detrimental oil-laden air. Cylinder compressors have carbon piston rings—need no oil or other lubricant. Description & qualities of three types available. Bulletin 728 Supplement D.  
288FF Chicago Pneumatic Tool.

**Compressors, Oil Free.**.....Offers complete line of compressors from 163 to 8800cfm. at pressures up to 100 psi. Describes standard compressors, oxygen generators, vacuum pumps and boosters. Bulletin A-92.  
288GG Joy Mfg. Co.

**Compressors, Steam-Powered.**.....Information on product designed to compress air or gas with greatest over-all efficiency. Features full-floating bearings. Wear on non-adjustable bearings is slight. Bulletin 3444-A.  
288I Ingersoll-Rand Co.

**Compressors, Vertical.**.....Water-cooled, double-acting, single-stage compressor built to deliver medium amounts of air constantly. Offers replaceable crosshead guides and cylinder liners, force-feed lubrication. Bulletin A-43.  
288HH Joy Mfg. Co.

**Fans.**.....Exceptional fan equipment for industrial air & material handling features: high efficiency; rugged, tight construction; 3 interchangeable wheels—each with radial blades; etc. Illustrated Bulletin 702.  
288I Clargo Fan Co.

**Fans.**.....Offers helpful data concerning cooling and drying problems, system ventilation, and open surface tank ventilation. Dimensions, applications and performance data in 12 p. illustrated Bulletin 650.  
288JJ Robbins & Meyers.

**Fans.**.....Company provides Bulletin with pertinent data on fan installation, operation, maintenance & lubrication, as well as recommended velocities for exhaust hoods, fan laws & formulae, etc. Bulletin A-108.  
288JJ Hartzell Propeller Fan.

**Fans.**.....Fans are precision engineered, adapted from high speed aircraft propellers. Have adjustable blade pitch & anti-flutter design...require less hp. Full information included in useful reference.  
288KK Koppers Co.

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# AAF Presents 3 NEW PRODUCTS

## FOR CHEMICAL PLANT DUST CONTROL

**1 AMERclone Dry Centrifugal Collector** designed to handle large exhaust volumes containing dry, granular dust in large concentrations. Strictly a product of AAF research, AMERclone offers many features new to dry centrifugal design that result in these important advantages—

**High Collection Efficiency.** AMERclone offers collection efficiencies equal to or better than any centrifugal unit available today.

**Requires Less Space.** The fact that a single AMERclone tube, 4" in diameter, has a cleaning capacity of 333 cfm as compared to a 100 to 150 cfm rating for conventional units makes for important space savings.

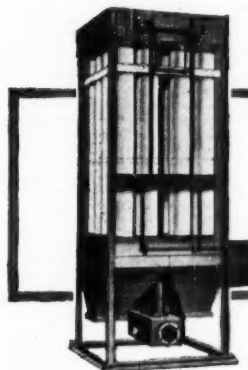
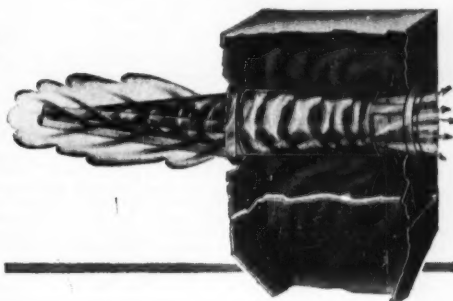
**Less Subject to Abrasion.** Abrasion resistance qualities are greatly increased with the use of thick wall gray iron castings, plus the fact that in AMERclone operation there is no recirculation of dust load to increase abrasive effect.

**Maintains Efficiency.** Collection efficiency of the AMERclone remains practically constant over a wide range of exhaust volumes with the compensating feature of the secondary air circuit.

For complete AMERclone data, write for AAF Bulletin No. 291.

**AMERclone**

DRY CENTRIFUGAL COLLECTOR



**AMERjet**

FABRIC ARRESTER

**2 AMERjet Fabric Arrester** designed to handle extremely fine particles or collect material dry for reclaiming. Like all AAF Dust Control Products, AMERjet offers these basic features: (1) small space requirements; (2) maintained performance over a wide range of operating conditions; (3) constant exhaust volume; (4) high collection efficiency.

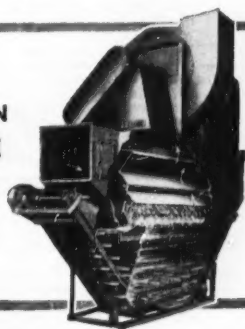
For complete AMERjet data, write for Bulletin No. 279.

**3 Design 4 Type N ROTO-CLONE Hydro-Static Collector**—A new version of AAF's famous Hydro-static precipitator which, in addition to the proven high efficiency cleaning action of its inverted S-shape water curtain, now offers—

- Improved and simplified entrainment separators to further reduce unit's low maintenance costs.
- Addition of 4 larger sizes to permit handling of exhaust volumes up to 50,000 cfm.
- Improved water level control maintains performance under extremes in operating conditions.

For complete Type N data, write us for AAF Bulletin No. 277.

DESIGN 4 TYPE N  
**ROTO-CLONE**  
HYDRO-STATIC  
COLLECTOR



**American Air Filter**

COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 326 Central Avenue, Louisville 8, Kentucky



**Fans, . . . . .** Multi-blade aluminum fans are engineered specially for cooling tower application . . . and because they are constructed of lightweight alloys operate more smoothly, quietly, efficiently. Details in Bulletin CF-54, 290A Marley Co.

**Fans, Adjustable-Fitch, . . . . .** Adjustable pitch fans are especially desirable for cooling tower, heat exchanger & mine service. Specifications plus performance figures for fans used in mine installations. Bulletin A-111, 290B Hartzell Propeller Fan.

**Fans, Duct, . . . . .** Axial flow duct fan in elbow or straight line types. Compact, light weight, economical and designed to operate against static pressure, very easily handled. Information in Bulletin No. F-10, 290C L. J. Wing Mfg. Co.

**Fans, Exhaust, . . . . .** Introduces a complete new line of corrosion-resisting exhaust fans. Offers pertinent data covering construction, dimensions, weights, and performance characteristics. Bulletin F/1, 290D Duriron Co.

**Fans, Propeller, . . . . .** Fans available in many sizes, to 90,000 cfm. Can handle ventilating & exhausting jobs at lower flat cost & lower cost installation. Two booklets offered. Bulletin 3865, Heavy-duty type. Bulletin F3790, 290E Buffalo Forge Co.

**Fans, Propeller, . . . . .** Specification, dimensions, performance figures in 43 p. Describes 13 types of fans including 3 newly developed models, 3 types of roof ventilators, unit heaters, intake air units. Bulletin A-109, 290F Hartzell Propeller Fan Co.

**Motor-Pumps, . . . . .** Self-priming, portable, close-coupled motor-pump units deliver 600 gallons per hour at 10 ft. head; 270 gallons per hour at 50 ft. head maximum. Design & performance features in Form 0263, 290G Jabco Pump Co.

**Pumping Units, . . . . .** New packaged units make for efficient & economical means of straining, heating & pumping. Complete description of components of the unit. Diagrams & photos in 8 p. Bulletin No. 16-H, 290H Schutte & Koerting Co.

**Pumps, . . . . .** Reduce maintenance cost . . . feature rugged construction & design simplicity. Wearing parts replaced easily, quickly, at low cost. Range from 10 to 2400 hp. Catalog provides complete data, 290I Aldrich Pump Co.

**Pumps, . . . . .** Handle slurries and pulps which combine corrosive liquid with suspended solids. Capacities to 10,000 gpm. Heads to 270 ft. Temperatures to 250 F. Information in Bulletins Nos. 52B7112 & 52B6381, 290J Allis-Chalmers Mfg. Co.

**Pumps, . . . . .** Company makes available an informative booklet designed to help engineers in choosing the correct pump for each application. Includes valuable tables and charts. Bulletin No. TS-6C, 290K Viking Pump Co.

**Pumps, . . . . .** Corrosion-resistant pumps with increased size & capacity range. New CNG Worthite pump in 21 sizes, 3" to 4", up to 2000 gpm. Heads up to 200 ft. Offers descriptive Bulletin No. W-350-B14, 290L Worthington Corp.

**Pumps, . . . . .** For dependable pump service under tough operating conditions. Available in 12 standard alloys, with heads to 240 ft. and capacities to 2000 gpm. Offers full details in Bulletin F/1, 290M Duriron Co.

**Pumps, . . . . .** Literature describes company line of close-coupled pumps for alloy construction. Compact, sturdy and easily installed. Shafts in permanent alignment. Supplies complete details in Bulletin No. 975, 290N Buffalo Pumps.

**Pumps, . . . . .** Describes pumps for handling fine abrasives in suspension or corrosive liquids. Heads to 260 feet. Capacities to 1300 gpm. Temperatures to 250 F. Full details in Bulletin No. 52B6615, 290P Allis-Chalmers Mfg. Co.

**Pumps, . . . . .** Detailed Bulletin completely describes and illustrates the company line of economical all-purpose pumps —water handling pumps available in the widest range of sizes and horsepower. No. B-2300, 290Q Peerless Pump Div.

**Pumps, . . . . .** Designed and constructed to withstand abusive service—such as pumping highly abrasive mixtures, corrosive liquids, hot solutions or heavy slurries. Provides complete details in Bulletin SWO, 290R Nagle Pumps.

**Pumps, . . . . .** To force liquids, solutions or gases through tubing . . . easily, quickly. Feature no corrosion, no contamination, no valves to clog, etc. Offers complete information in illustrated Folder, 290S Sigmamotor, Inc.

**Pumps, . . . . .** Information on the number of rings, depth of box, type of packing . . . chemical and physical properties of fluid being pumped, speed of shaft, and other pertinent usable facts, in Bulletin S-147, 290T Taber Pump Co.

**Pumps, Acid, . . . . .** Submersible acid pumps with vertical shaft for pumping acids or slimy liquids from containers, tanks, pits, etc. No priming is required. Simply serviced. Illustrated literature, 290U Neumann & Welchman.

**Pumps, Acid, Centrifugal, . . . . .** Acid pump without a stuffing box. Renewable parts reduced to minimum giving greater safety in operation with low maintenance. Includes complete data on advantages and construction, 290V Neumann & Welchman.

**Pumps, Boiler Feed, . . . . .** Complete information on multistage clear water pumps for pressures up to 500 psi. Rugged and efficient boiler feed pumps used widely. Offers details on features in Bulletin No. 980, 290W Buffalo Pumps.

**Pumps, Boiler Feed, . . . . .** Used throughout industry for many services. Capacities range up to 2,000 gpm, pressures to 1,200 psig, temperatures to 350F. Contains complete information in Catalog 1502, 290X De Laval Steam Turbine.

**Pumps, Boiler-Feed, . . . . .** Service-proved, 8-stage Class HMTA boiler-feed pumps can deliver 300 gpm of 345° feed water at 1095 psi. Feature modern "Unit-Type Rotor" design. Offers detailed Catalog No. 7233, 290Y Ingersoll-Rand Co.

**Pumps, Bronze, . . . . .** Makes available illustrated literature which covers the Hypro Model 4300 bronze pump, designed for continuous water recirculation use. Includes data on features and performance, 290Z Hypro Engrs.

**Pumps, Centrifugal, . . . . .** Impervious graphite pumps feature mechanical seal with enclosed coolant, rugged type SN armored connections, interchangeability of parts, wide capacity range, etc. Catalog Section S-7250, 290A National Carbon Co.

**Pumps, Centrifugal, . . . . .** Information on centrifugal & turbine type pumps. Selection table shows quickly how many gpm each type of pump will deliver under various head capacities. Completely illustrated, 290B N. Y. Air Brake Co.

**Pumps, Centrifugal, . . . . .** No leakage or contamination of fluids . . . seals-in expensive, toxic, or corrosive fluids . . . protects plant & personnel. Available in from 3 to 3 hp. Details & features in Bulletin No. G-1000, 290C Chempump Corp.

**Pumps, Centrifugal, . . . . .** Mechanical seal offers new development in pump design — eliminates leakage & assures trouble-free life. Capacities to 1200 GPM, heads to 400 feet. Descriptive Catalog No. ET-452, 290AA Bell & Gossett Co.

**Pumps, Centrifugal, . . . . .** Provides sectional drawings, installation views, large chart showing interchangeability of parts, etc., in 18 p. For boiler feed, refinery, process work & mine pumping services. Form No. 7251, 290AB Ingersoll-Rand Co.

**Pumps, Centrifugal, . . . . .** "Centrifugal Pump Fundamentals" explains principles of operation, defines various terms used in pump calculations, & works out typical pump problems. Fully diagrammed, 290AC Ingersoll-Rand Co.

**Pumps, Centrifugal, . . . . .** Describes centrifugal pumps for filter service in the dry cleaning field. Built in sizes from 1/2 through 50 hp. Includes performance curves, dimensions and discharge positions in Form No. 7274, 290AD Ingersoll-Rand Co.

**Pumps, Centrifugal, . . . . .** Handle very dirty, muddy, thick, viscous and solid-bearing liquids or corrosive substances and pulps. Describes design, construction, service range, etc., in illustrated reference, 290AE Neumann & Welchman.

**Pumps, Centrifugal, . . . . .** Two-stage horizontal pumps designed for long-range, low-cost service. In capacities from 75 to 3000 gpm, sizes from 2" to 8" discharge, & heads to 750 ft. Furnishes Bulletin No. 1501, 290AF De Laval Steam Turbine.

**Pumps, Centrifugal, . . . . .** Offer high quality design & materials; maximum standardization & interchangeability of parts; heads up to 260 ft; capacities 200-6400 gpm; 19 sizes etc. Details in Bulletin 721.6, 290AG Goulds Pumps.

**Pumps, Centrifugal, . . . . .** Feature superior performance in pumping highly abrasive mixtures, corrosive liquids, hot solutions or heavy slurries. Horizontal & vertical shaft types in complete range of sizes. Catalog 5206, 290AH Nagle Pumps.

**Pumps, Centrifugal, . . . . .** Pumps operate without sealing water. For pumping abrasive or corrosive solutions that must be delivered undiluted. Molded rubber protective parts. Supplies full information in Brochure No. 853, 290AI Allen-Sherman-Hoff Pump.

**Pumps, Centrifugal, . . . . .** Features & advantages of stainless steel centrifugal pumps. Includes engineering information, performance curves, capacity charts, seal application, etc. in illustrated Catalog No. 253, 290AJ Tri-Clover Div.

**Pumps, Centrifugal, . . . . .** Describes Buna N & natural hard rubber pumps, valves & pipe fittings. Covers information on performance, properties, chemical resistance, specifications. Fully illustrated, 290AK Vanton Pump Corp.

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**Pumps, Centrifugal.**.....Handle corrosive liquids. Now available in 8 different materials. Information on these new materials, performance curves, specifications, dimensions, etc., in Bulletin 725.3.  
291A Goulds Pumps.

**Pumps, Centrifugal.**.....Pumps designed for easy maintenance and service. Makes available a new illustrated Bulletin which contains design features, service features, specification data, etc. No. 1001B.  
291B De Laval Steam Turbine.

**Pumps, Centrifugal.**.....New fractional hp pump requires no drive shaft... no shaft seal... eliminates 90% of difficulties encountered with conventional pumps. Characteristics, specifications, performance.  
291C Rostoria Pressed Steel.

**Pumps, Centrifugal.**.....Type UNB 2-stage centrifugal pumps for working pressures up to 400 psi & capacities up to 1300 gpm. Offer long efficient service with low maintenance costs. Data in Bulletin W-318-S27.  
291D Worthington Corp.

**Pumps, Chemical.**.....Contains original approach to NPSH (net positive suction head), together with important information on use of this concept in selecting turbine pumps for chemical service. Data in Section No. 100.  
291E Roy E. Roth Co.

**Pumps, Chemical.**.....Data on corrosion-resisting pumps for heavy-duty chemical service. Available in 12 standard alloys to supply heads to 240 ft. & capacities to 2000 gpm. Find information in Catalog No. 54.  
291F Duriron Co.

**Pumps, Chemical.**.....Handle liquids, pastes, abrasive slurries, mild acids & many other materials. Only one moving part a rotor turning within a stator. Self-priming. Details in illustrated Bulletin No. 30-B.  
291G Robbins & Meyers.

**Pumps, Chemical.**.....Contains description and essential advantages of centrifugal pumps with pressure-relieved stuffing-box for the chemical industry. Two basic designs. Fully detailed and illustrated.  
291H Neumann & Welchman.

**Pumps, Chemical.**.....Handle vast group of liquids in chemical industries at lowest possible operating cost & maintenance. Rubber lining assures efficient service. Offers valuable details in Bulletin No. 982.  
291I Buffalo Pumps.

**Pumps, Chemical.**.....Corrosion-resistance of chemical pumps covers entire range from strong sulphuric acid to strong caustic soda. Capacities from 10-4000 gpm—sizes 1-125 hp. Data in Bulletin 7095.  
291J Ingersoll-Rand Co.

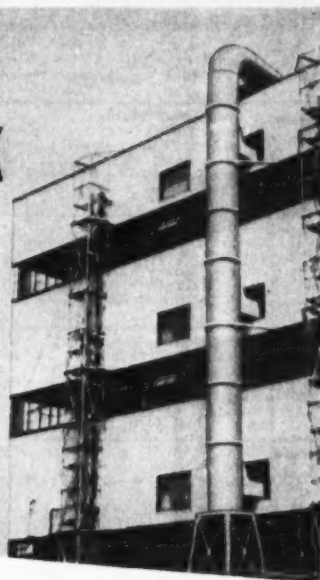
**Pumps, Chemical Process.**.....Makes available valuable information on pumps for chemical process work—truly all-purpose pumps for higher heads and capacities. Complete description in Bulletin B-1600.  
291K Peerless Pump Div.

**Pumps, Chemical Transfer.**.....For Continuous or intermittent duty in transferring process chemicals. Mechanical shaft seals eliminate stuffing box troubles & shaft leakage. Provides Bulletin B-1606.  
291L Peerless Pump Div.

**Pumps, Close-Coupled.**.....Information on close-coupled pumps for general purpose use. Heads to 550 feet, capacities to 3500 gpm & temperatures to 250 F. Offers complete data in Bulletins No. 52B6083 & No. 52B6140.  
237a Allis-Chalmers Mfg. Co.

**Pumps, Controlled Volume.**.....Provides complete information on flow control instruments designed to provide metering accuracy at higher pressures... higher capacities. Details in Bulletin 1153-A and 553.  
291M Milton Roy Co.

## IS A PLA-TANK® STACK THE ANSWER TO YOUR FUME PROBLEM?



Shown here is a light-weight, easily-erected PLA-TANK stack which handles fume exhaust at the new thorium plant of the Lindsay Chemical Co., West Chicago, Ill.

The stack has a 44" diameter, is 69' long including 90° elbow, cross run to fan chamber and riser beyond fan. There are inlets from three floors to handle exhausts from individual tank systems. Stack was prefabricated with flanges for fast installation.

PLA-TANK STACKS may also be the answer to your problem of venting corrosive fumes — inside or out. Consider these many advantages.

... manufactured from long-life, resin-bonded glass fiber laminate

... resistant to a wider variety of fumes and temperature than ever before

... not affected by extremes in weather

... light weight, easy to install; need less rigging and support; save handling, freight, shipping charges

... competitively priced; available in diameters to 60"

Let us help you solve your problem the modern way — with PLA-TANK Stacks, Ducts, Hoods, Tanks and Pipe. Write today for free data sheets.

**THE Chemical CORPORATION**

61 WALTHAM AVE., SPRINGFIELD 9, MASS.

P-20



**Pumps, Controlled Volume.....**Air-powered controlled volume pumps solve low-capacity flow control problems. Includes data on construction features, applications, operating principles, etc. in 16 p. Bulletin No. 1053.  
292A Milton Roy Co.

**Pumps, Controlled Volume.....**Provide solution to low capacity flow control problems. Supplies pertinent information on three laboratory and pilot plant controlled volume pumps in Technical Papers No. 53 and No. 59.  
292B Milton Roy Co.

**Pumps, Controlled Volume.....**Illustrated, 24 p. covers line of Pulsafeeder diaphragm-type controlled volume pumps... for handling corrosive & non-corrosive liquid chemicals. Complete data in Bulletin No. 440.  
292C Lapp Insulator Co.

**Pumps, Controlled Volume.....**Merse-metric pumps—the new controlled volume pumps for submerged operation—feature no leakage to atmosphere, no diaphragm, no contamination. Bulletin No. 1153-B.  
292D Milton Roy Co.

**Pumps, Controlled Volume.....**Pumps are designed to provide accurate metering of clear liquids in minute quantities. Complete data on capacities, pressures, materials of construction, operating details. Bulletin 653.  
292E Milton Roy Co.

**Pumps, Double Suction.....**Rugged double suction pumps assure long life & low maintenance. Offer heavy duty construction, wide material choice, unit responsibility, etc. Describes pumps in Bulletin No. 08B6146.  
292F Allis-Chalmers Mfg. Co.

**Pumps, Double Suction.....**Describes fully the valuable advantages and features of double suction clear water pumps. Hydraulically balanced and of the finest obtainable construction. Details in Bulletin No. 955.  
292G Buffalo Pumps.

**Pumps, Filter.....**Describes function, design & application of corrosion-resistant filter pumps. Covers filter pump equipment in 50-100 gal. per hr. range, designed for filtering all types of corrosive solutions. 8 p.  
292H Sethco Mfg. Co.

**Pumps, Fuel Oil.....**For pumping heavy fuel oils at pressures up to 100 psi with high, positive suction & discharge. Includes important information on construction, rotation, dimensions, etc. in Bulletin No. R-317.  
292I Eclipse Fuel Engrg. Co.

**Pumps, Gear.....**Capacities from 1 gph to 1000 gph & pressures to 3500 psi. Types & sizes available, characteristics, uses. Photographs, cutaway drawings, & tables. All information in Bulletin No. 17-A.  
292J Schutte & Koerting Co.

**Pumps, Gear.....**Company line of gear pumps maintain efficiency handling corrosive liquids. Includes valuable information on features and advantages in fully illustrated Bulletin No. G-2.  
292K Sier-Bath Gear & Pump.

**Pumps, High Pressure.....**Information on Triplex high pressure pumps and Gaulin Industrial homogenizers. Includes complete details on features, applications, specifications, etc., in illustrated Bulletin No. 1-53.  
43b Manton-Gaulin Mfg. Co.

**Pumps, High Vacuum.....**Cites examples of typical vacuum systems using high vacuum pumps, and provides solutions to various problems in pump selection, in completely revised brochure, Catalog 700.  
292L F. J. Stokes Mach. Co.

**Pumps, Horizontal, Split Case.....**Offers detailed information on split case horizontal pumps. Provide numerous features—top quality...superior performance...highest efficiency. Bulletin B-1300.  
292M Peerless Pump Div.

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**Pumps, Hydraulic.....**Single-stage vane-type pumps provide continuous operation at pressures up to 2000 psi. Cutaway photographs, technical drawings, performance data charts, etc. in Bulletin No. DP-300.  
292N Dudco Div.

**Pumps, Jet.....**Use steam, water, air or gas under pressure to transfer or mix, without clogging, any liquid which will flow through pipes. Covers data on the complete line of pumps in Bulletin No. 512.  
292O Penberthy Injector Co.

**Pumps, Magnetic Drive.....**Present many features—liquid is confined to wetted end...leakage eliminated...revolutionary design...no packing—no seals...etc. Offers details in illustrated Bulletin B-1607.  
292P Peerless Pump Div.

**Pumps, Metering.....**Meter or proportion small volume flows. Data on standard 1, 2, 3 and 4 feed units, jacketed units, variable speed units, etc. Information on all sizes and types in Catalog UP-52R.  
292Q Hills-McCanna Co.

**Pumps, Metering & Proportioning.....**Explains operation of the pump, illustrates its design features & gives complete capacity & pressure information on the entire line, in new Bulletin KP-54.  
292R Hills-McCanna Co.

**Pumps, Motor.....**Makes available a very interesting & informative Booklet dealing with the selection of the proper motor pump for any specific job. Data covered in fully illustrated Form No. 7123.  
292S Ingersoll-Rand Co.

**Pumps & Motors.....**Describes variable delivery pumps, constant delivery pumps, duplex pumps, feed pumps, constant displacement motors, etc. Includes complete data on specifications in Bulletin No. 10951-C.  
292T Oilgear Co.

**Pumps, Multi-Stage.....**For chemical, petroleum & general purpose use in medium high temperature range. Capacities to 3500 gpm. Heads to 550 feet. Temperatures to 550 F. Details in Bulletin No. 52B6105.  
292b Allis-Chalmers Mfg. Co.

**Pumps, Multi-Stage.....**Company offers data on two, three, four and five-stage pumps—multi-stage split case pumps for medium capacities at high heads. Provides a full description of pump line in Bulletin B-1400.  
292U Peerless Pump Div.

**Pumps, Oil Diffusion.....**Literature includes complete physical dimensions, operating information, & performance curves for each type of MCF high vacuum oil diffusion pumps. Illustrated Data Sheet No. 6-55.  
292V Consolidated Vacuum.

**Pumps, Packagingless Water.....**Furnishes pertinent information on the company line of packagingless water pumps—mechanically shaft sealed, split case, general-purpose pumps—in illustrated Bulletin B-1350.  
292W Peerless Pump Div.

**Pumps, Paper Stock.....**A pump for every liquid, consistency and head. Non-clogging enclosed impellers retain initial efficiency. Mill proven for many years. Company furnishes data in Bulletin No. 953.  
292X Buffalo Pumps.

**Pumps, Piston-Diaphragm.....**For controlled-volume pumping of fluids. Flow charts, typical applications, description & specifications of models of various capacities & constructions, in Bulletin 300.  
292Y Lapp Insulator Co.

**Pumps, Plastic.....**Covers line of plastic pumps designed to handle highly corrosive fluids and abrasive slurries. Includes cutaway illustrations, applications, performance information, specifications, etc.  
292Z Vanton Pump Corp.

**Pumps, Plastic.....**Low cost, self-priming pumps ½" port sizes, suitable for pharmaceuticals, descaling, hypo & film solutions, muriatic solutions, etc. Details & features in fully illustrated Bulletin No. JPS-3010.  
292AA Jabsco Pump Co.

**Pumps, Positive Displacement.....**For accurately feeding chemical solutions used in water works & industry. Covers details on performance, installation, applications, specifications, etc. in illustrated Bulletin No. PM-20.  
292BB Precision Mach. Co.

**Pumps, Process.....**In wide choice of materials...to handle many types of abrasive or corrosive material at temperatures up to 260F. These process pumps feature no leakage. Complete data in Bulletin No. 08B6615.  
292CC Allis-Chalmers Mfg. Co.

**Pumps, Processing.....**Covers important data on pumps for heavy-duty processing. These pumps feature rugged center-line-mount design for hydrocarbons and process liquids. Complete details in Bulletin B-1605.  
292DD Peerless Pump Div.

**Pumps, Propeller.....**Well adapted for circulating service because of simplicity, high efficiency and low first cost. Includes a summary of acid and chemical pump information in descriptive Bulletin No. 203-6.  
77 Lawrence Pumps.

**Pumps, Proportioning.....**For additives or chemical reagents. Meet most requirements for low capacity medium pressure chemical feed pumps. Durable, compact, inexpensive. Offers data on features in Bulletin No. 1105.  
292EE Proportioners.

**Pumps, Proportioning.....**Photographs illustrate various pumps plus a Web-cell Continuous Dialyser & a Desaga Blender & Shaker. Describes construction, operation, capacities, & special uses. 4 p. Bulletin No. 16.  
292FF Brosites Mach. Co.

**Pumps, Proportioning.....**3 pumps in one—7,500, 15,000 or 30,000 psi working pressure made possible by interchange of piston & cylinder assemblies in the same pump frame. Offers Bulletin No. 4061-A.  
292GG American Instrument Co.

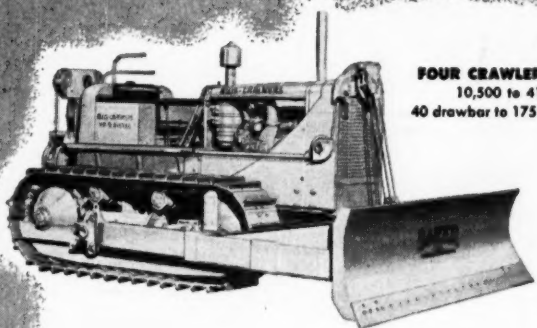
**Pumps, Proportioning.....**Simplex & duplex reciprocating plunger pumps for pressures to 20,000 pounds & capacities from a few cc per min. to over 900 gals. per hr. Detailed & illustrated Bulletin P-1153.  
292HH Phila. Pump & Machy.

**Pumps, Refinery Type.....**Heavy duty pumps for volatile liquids & high temperature process applications. Capacities to 1300 gpm. Heads to 600 feet. Temperatures to 800 F. Information in Bulletin No. 52B7775.  
292I Allis-Chalmers Mfg. Co.

**Pumps, Rotary.....**Compact, economical, motor driven pump units. Range of capacities from 70 to 226 gpm at 60 psi. Each size has 3 interchangeable gear ratios. Gives sizes, capacities, etc. in detailed Bulletin No. 21.  
292II Geo. D. Roper Corp.

**Pumps, Rotary.....**Feature fast, thorough stripping action. Efficient stripping is possible because of suction lift created by "gear-within-a-gear" pumping principle. Complete details in Bulletin No. 548C.  
292JJ Viking Pump Co.

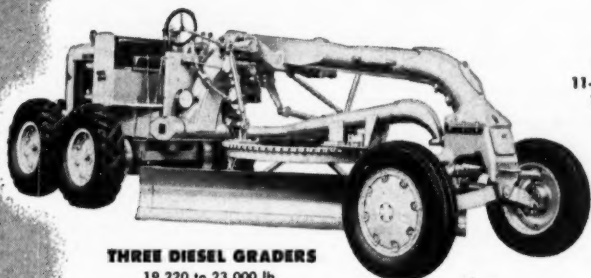




**FOUR CRAWLER TRACTORS**  
10,500 to 41,000 lb.  
40 drawbar to 175 net engine hp.



**TWO MOTOR SCRAPERS**  
10- and 14-yd. struck capacities  
176 and 280 net engine hp.  
Speeds to 25.3 mph.



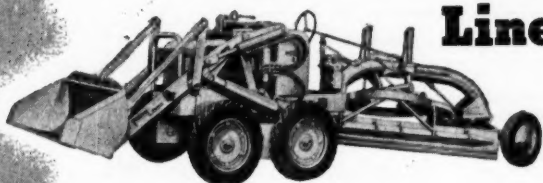
**THREE DIESEL GRADERS**  
19,220 to 23,000 lb.  
78 to 104 brake hp.  
Speeds to 20.4 mph.

**TWO MOTOR WAGONS**  
11- and 14-yd. struck capacities  
176 and 280 net engine hp.  
Speeds up to 25.3 mph.



## Complete

# Line of Modern Equipment for Stripping, Loading and Hauling in Pit and Plant



**LOW-COST MODEL D GRADER**  
(with optional rear-end loader)  
8,800 lb. — 50 brake hp.  
Speeds to 25.6 hph.

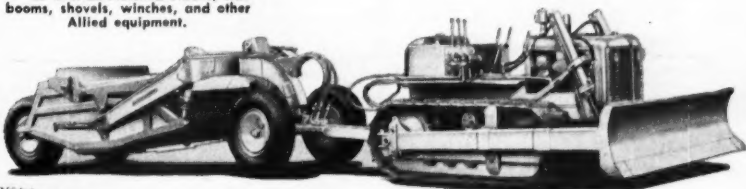
### FOUR TRACTOR SHOVELS

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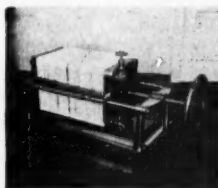
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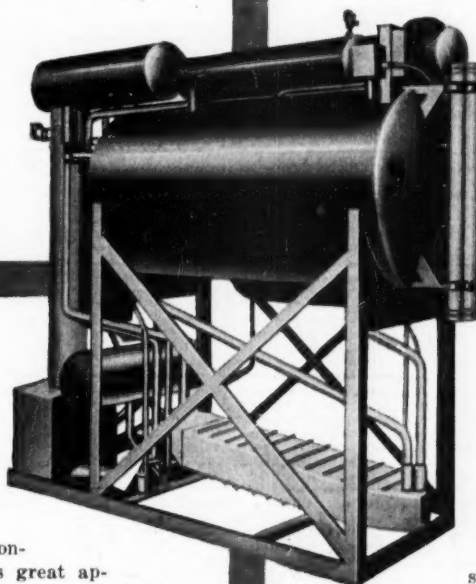
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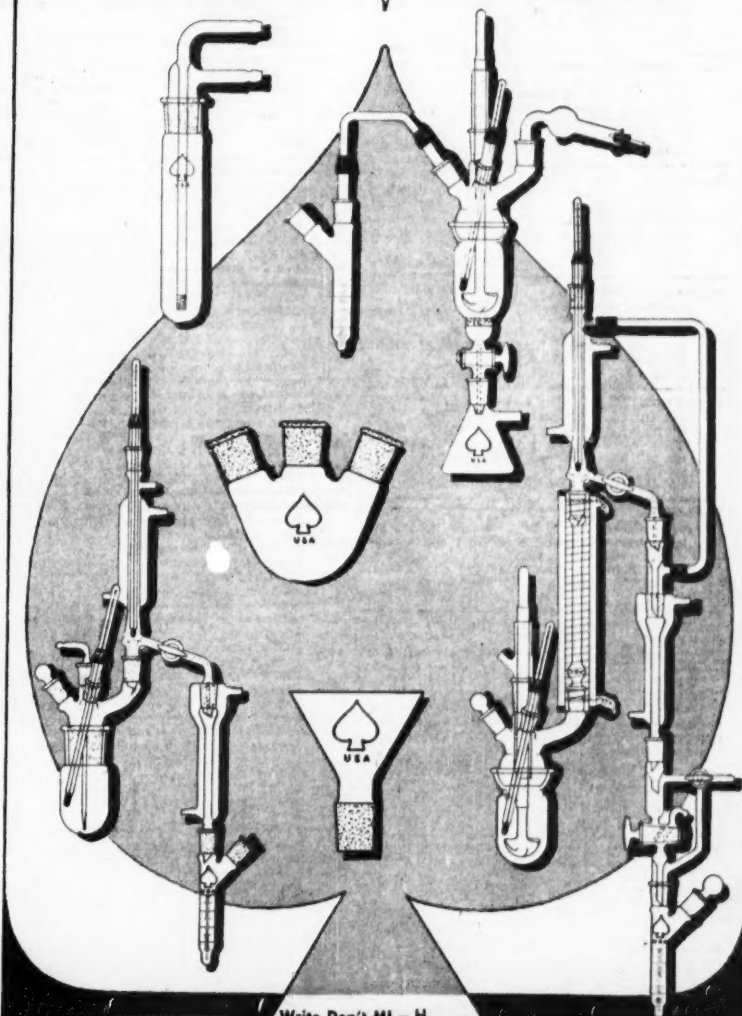
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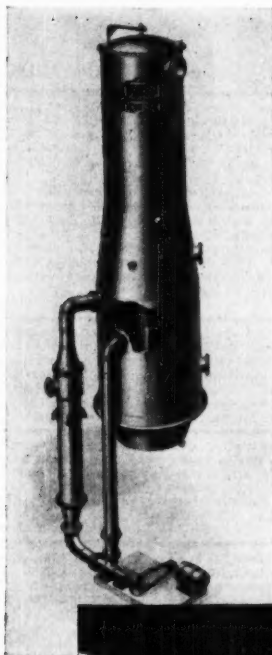
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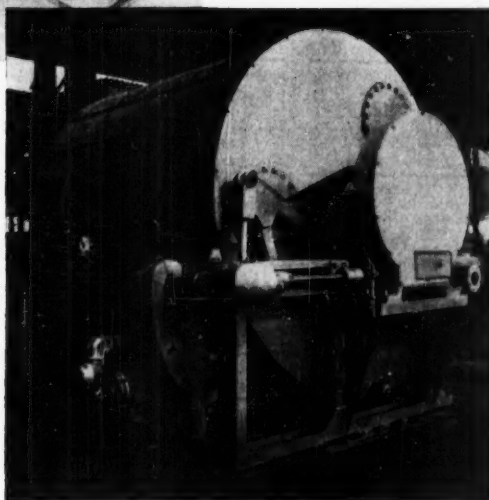


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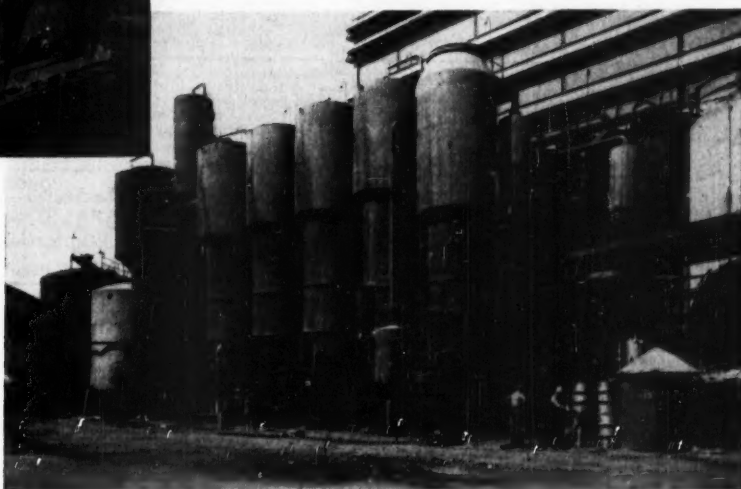
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**Oxygen Recording.**.... Explanation of how paramagnetic principle, how applied & how resulting signal is handled by recorder. Sampling unit described. Applications, performance, specifications. Folder ND46-91(3). 302Y Leeds & Northrup Co.

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303C General Elec. Co.

**Pyrometer-Controllers.....** Covers specifications & prices for indicating electronic pyrometer controllers, indicating mercury switch pyrometer controllers, etc. in valuable detailed Bulletin No. P1260.  
303D Bristol Co.

**Pyrometers, Hand.....** Uses & applications for portable instruments which measure temperature of any surface, liquid, gas or molten metal from 0 to 1500 F. Request descriptive Bulletin No. GEA-6020.  
303E General Elec. Co.

**Pyrometers, Optical.....** Describes features, principles & method of operation, user maintenance, applications, models & specifications, accessories, etc. in 8 p. Catalog 85. Includes photos & illustrations.  
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**Pyrometers, Portable.....** Line of sturdy precision instruments bring instant, accurate results . . . wherever temperature readings are required—on the production line, in the lab, or in the field.  
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**Pyrometers, Radiamatic.....** Illustrated 28 p. covers 4 types of Radiamatic radiation detectors for measuring temperatures from 125 to 7000 F. Units feature accuracy, speed, & versatility. Catalog 9301.  
303H Minneapolis-Honeywell.

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303J Radiation Counter Labs.

**Radiation Instruments.....** Catalog gives data on new automatic sample changer, mobile scintillation unit & an isotope analysis kit. Describes scintillation equipment & crystals, health safety equipment, etc.  
303K Professional Equip. Co.

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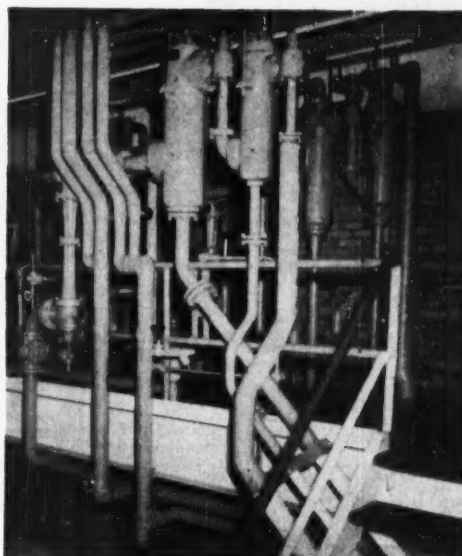


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**Radioactive Reagents.**.....Development, applications, instrumentation of new micro-curve radioscopes. Use requires no A.E.C. authorization. Redi-scaler assembly described. Offers Bulletin No. F8-231.  
304A Fisher Scientific Co.

**Radioactivity.**.....For petroleum industry. Literature includes description of refinery applications such as the measure of large flow rates, detecting leak locations, studying entrainment rates in petroleum towers. 16 p.  
304B Tracerlab, Inc.

**Radiography.**.....Folder describing specially designed handling equipment for cobalt 60 sources. Directional & Panoramic Exposure Shields make gamma radiography safe, practical, inexpensive. Details on specifications.  
304C Tech. Operations.

**Receivers, Tank Gage.**.....Remote reading for 36-ft. range tanks & smaller. Feature special design, increased efficiency, easy reading, flexible installation, choice of calibration, reasonable unit cost. Bulletin No. CP-3004.  
304D Vapor Recovery Systems.

**Recorder-Controllers, Multi-Point.**.....New design features for circular chart recorders. Cites advantages of "Turret" pen assembly and includes construction information and specifications. Bulletin F-452M.  
304E Fielden Instrument Div.

**Recorders.**.....Furnishes detailed information on a portable recorder built to full-size instrument reliability. Also includes data on recording psychrometers and hygrometers. Catalog No. 400 on request.  
304F Gotham Instruments Div.

**Recorders.**.....Centralizes operating data from process units on one recording instrument. Measures temperature, pH, speed, weight, electrical load. Unaffected by vibration. Information in Catalog No. ND46.  
304G Leeds & Northrup Co.

**Recorders.**.....New miniature electrical recorders offer extreme compactness... Cormag self-shielding mechanism... A-C and D-C models. Offers Bulletin covering complete specifications and prices.  
304H Weston Elec. Instrument.

**Recorders, Analog Data.**.....Provide visual or printed records of almost any physical quantity converted into a corresponding voltage. Includes information on recorder features & applications. Fully illustrated.  
304I Streeter-Amet Co.

**Recorders, Electronic.**.....Informative 8 p. technical data bulletin covers line of electronic recorders. Feature simplified design, accuracy to  $\pm 1\%$  of full scale, and self-starting operation from low energy sources.  
304J Robertshaw-Fulton Controls.

**Recorders, Indicating.**.....Thermo electronic indicating-recorders easily adapted to measure humidity, solution conductivity, speed, pH, direct current, DC voltage, etc. Find complete details in Bulletin No. 60-E.  
304K Thermo Electric Co.

**Rectifiers.**.....Bulletin describes different types of electroplating rectifiers, with capacities from 5 to 50,000 amperes, standard & special designs. Also covers information on regulators & controls. No. B 20-54.  
304L Wagner Bros.

**Rectifiers, Mechanical.**.....New mechanical rectifier unit substitution for providing d-c power. Features highest efficiency, long control life, easy maintenance, etc. Details in fully illustrated Bulletin No. GEA-6083.  
304M General Elec. Co.

**Rectifiers, Mechanical.**.....Superior features result in practical immunity of rectifiers to arc-backs from all causes, low contact wear, low maintenance, low service costs. Easy to install, requiring little space. Complete data.  
304N Brown-Boveri Corp.

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**Reflectometers.**.....Data on high precision, null balance type instruments for automatically measuring reflectance, color, & with attachments, gloss. Accessory instrumentation also described. Bulletin No. 132.  
3040 Gardiner Laboratory.

**Refractometers.**.....Industrial refractometers feature convenience of operation, speed of measuring, increase of accuracy, ease of maintenance. Includes data on specifications. Pamphlet No. CB7 8-52 2M.  
304P C. A. Brinkmann & Co.

**Regulating Equipment, Electronic.**.....Describes the company line of electronic power regulating equipment. Includes data on AC regulators, DC power sources, magnetic amplifier power supplies, frequency changers.  
304Q Sorensen & Co.

**Regulators.**.....Compact, self-contained regulators are most effective, most accurate, low-cost means to control the flow of light slurries and liquids. Literature provides complete details on company line.  
304R W. A. Kates Co.

**Regulators, Flow.**.....Covers new self-contained flow regulating device for clean gas-free liquids. Requires no air or electric power. Data on features, operation, application, etc., in Catalog 10-F-70.  
304S Fischer & Porter Co.

**Regulators, Pressure.**.....Available for steam, air, gas, oil, water or other fluid. Includes new internal construction features which give higher capacity & close regulation, in illustrated Bulletin C-95.  
304T Fisher Governor Co.

**Regulators, Pump Pressure.**.....Accurately and automatically control discharge pressure from steam operated, reciprocating or turbine driven pumps. Single seated—positive—responsive and accessible. Bulletin 5306.  
304U Leslie Co.

**Regulators, Temperature.**.....Designed to limit heater steam pressures to an adjustable maximum—need for separate reducing valve eliminated. Complete information on design features in Bulletin T50.  
304V Spence Engrg. Co.

**Regulators, Temperature.**.....Feature safe, dependable temperature control in industrial processes. Rugged controls are self-powered, self-contained, almost completely maintenance-free. Information in Catalog No. GC-D.  
304W Fulton-Syphon Div.

**Regulators, Temperature.**.....Designed for a wide range of applications. Vary the flow of steam or cooling water to heater or process to automatically maintain constant temperature. Information in Bulletin 5307.  
304X Leslie Co.

**Regulators, Voltage.**.....Automatic voltage regulators are superior in design, construction and performance. Available in ratings from .35 to 5.0 KVA. Includes features and advantages in Bulletin No. S351.  
304Y Superior Elec. Co.

**Sampling Systems, Dry Gas.**.....Illustrates and describes the operation of a sampling system for the dry gas samples encountered in many chemical applications, in detailed Bulletin No. 702.  
304X Arnold O. Beckman.

**Scanning Systems.**.....Eliminate high labor costs & human errors from scanning & recording. Give accuracy of 0.1%, speeds as fast as 1 recording operation per second. Covers data on specifications.  
304Y Telecomputing Corp.

**Servo Systems.**.....Amplifiers, converters & motors, adaptable to wide variety of servo loops & electromechanical systems. Applications, specifications, motor dimension data, etc. Data Sheet 10-20-3a.  
304Z Minneapolis Honeywell.

**Spectrographs.**.....Plane grating spectrograph for high dispersion analysis, low concentration samples, study of line shapes. Includes schematic drawing & specifications in Catalog EB-10-53.  
304AA Jarrell-Ash Co.

**Spectrographs, Grating.**.....16 p. Catalog describes product line. Also accessory equipment, data on production of diffraction gratings used, suggested spectrographic laboratory layouts, etc. Catalog G2-53 available.  
304BB Jarrell-Ash Co.

**Spectrographs, Production Control.**.....Covers spectrograph for instantaneous direct reading and photographic analysis specifically developed for research and rapid production control analysis.  
304CC Scientific Specialties Corp.

**Spectrometers.**.....Describes basic laboratory research units for rapid non-destructive analyses of chemical bonding situations. Also includes data on magnet system. Basic operating characteristics. Publication 40.  
304DD Varian Associates.

**Spectrometers, Analytical Mass.**.....Play an important part in the scientific attack on air pollution by positive identification and measurement of pollutants in air samples. Bulletin No. CEC-1800B-X21.  
304EE Consolidated Engrg. Corp.

**Spectrometers, Infrared.**.....Infrared spectrometers (Model 12-C) ideal for routine quality control in chemical laboratories. Includes information on utility, performance, flexibility, specifications, applications, etc.  
304FF Perkin-Elmer Corp.

**Spectrometers, Mass.**.....For chemical analysis by mass separation. Covers operations procedures and component parts and lists range, resolution, and system specifications, in fully illustrated Bulletin No. GEC-587A.  
304GG General Elec. Co.

**Spectrometers, Mass.**.....Detects gas leaks within its mass range. Extreme stability for unattended process monitoring in petrochemical industries. Cost and operation low. Bulletin No. CEC-1824-X4.  
304HH Consolidated Engrg. Corp.

**Spectrometers, Mass.**.....Spectrometers feature high accuracy, speed and reliability. They are used by refineries for analytical research as well as process control. Data in illustrated Bulletin No. CEC-1800B-X13.  
304II Consolidated Engrg. Corp.

**Spectrometers, Mass.**.....New acetylene production process uses continuous process-monitoring mass spectrometer... for "on the spot" control. Offers complete information in Bulletin No. CEC-1824-X18.  
304JJ Consolidated Engrg. Corp.

**Spectrophotometer Accessories.**.....Increase range, sensitivity, versatility and convenience of this universally accepted instrument—the Model DU spectrophotometer. Details in Data File 40-14.  
304KK Beckman Instruments.



# HAPMAN CONVEYORS

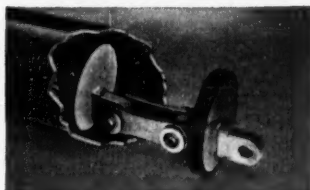
## HANDLE BULK MATERIALS AT GREAT SAVINGS

**HERE'S  
HELP!**

**HAPMAN TUBULAR CONVEYORS**  
with Sealed-pin Chain move almost any flowable material—wet or dry—through any plane or angle.

### What they are:

Hapman Conveyors consist of solid circular flights of Neoprene (or special materials), mounted at intervals on special, sealed-pin chain or wire cable operating within standard pipe or tubes.



Neoprene flights move materials through standard pipe.

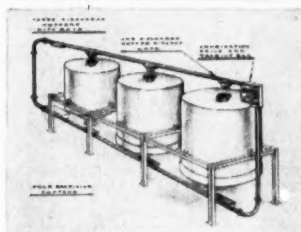
### What they do:

They move almost any powdered, granular and semi-liquid material at speeds up to 125 feet per minute—in single runs up to 400 feet long—through any plane or angle—with minimum clearance and outside support.

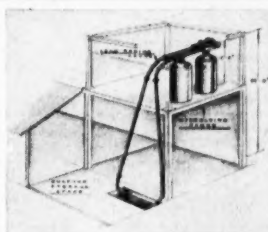
Patented Sealed-pin Chain incorporates compressed synthetic rubber washers to seal link-pins from abrasion of conveyed materials. Flexible chain twists to follow bends in pipe. Flights are usually of abrasive-resistant Neoprene, fixed between steel plates with rigid, sanitary surfaces. For special conditions, flights may be cast iron, stainless steel, fibre, etc. Hapman Vibrators assure discharge of powdered materials. Conveyors are quiet, self-cleaning, with very low power consumption. Because chain and pipe turn corners, transfer points and extra drives are seldom needed.

### How they're applied:

Often they're used where sanitation is vital. They are dust-proof, liquid-tight, odor-confining, self-cleaning. For carrying corrosive and non-corrosive chemicals, foodstuffs, abrasives, sludges, metal chips.



Abrasive material conveyor has multiple discharge points.



Tubular Conveyor feeding into processing tanks.

**Materials you can handle include:** **Bulk chemicals:** Powdered, granular, crystalline, semi-liquids—hot or cold. Corrosives, radioactive wastes, pharmaceuticals. **Powders:** Starch, flour, powdered sugar, resins, talc, coal, malt. **Abrasive dusts:** Emery dust, foundry sand, clay, aluminum oxide, ceramic powder, cast iron dust. **Sludges:** From quench tanks, settling tanks, brewery vats (spent grains and hops).

**Installed in many large plants:** Hapman Tubular Conveyors handle all kinds of bulk materials for firms such as American Cyanamid, General Chemical, Upjohn Co., Lever Brothers, Shell Oil, Crown Cork and Seal, Stroh Brewery, Goodyear Tire, and other processors. Also widely used in metalworking and auto manufacturing plants.

**Hapman CABLE-VEYOR**—Sheave-driven wire cable with interlocking Neoprene or plastic flights operating in pipe is used for specialized food and chemical applications.

**Hapman PNEUMATROL Sections**—May be included in conveyor to permit continuous, simultaneous feeding and processing of materials under pressure or vacuum.

**HERE'S  
HELP!**

**Chip-O-Matic**  
**RIB FLIGHT CONVEYOR**  
for chips, turnings, parts

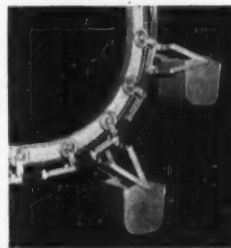
With Sealed-pin Chain protected from abrasives, the Chip-O-Matic automatically handles large chips, spiral metal turnings, small parts, stampings, scrap and bulk materials. Adaptable for removing parts from coolant tanks without loss of coolant. Neoprene wear strips on rib flights, simple, dependable design.



**HERE'S  
HELP!**

**MULTIPLANE Stif-Arm**  
**Bucket Trolley Conveyor**

One continuous circuit operates in several planes or angles—vertical, horizontal, inclined—with a single drive—due to patented Stif-Arm bucket hanger design and universal chain suspended from single I-beam trolley. Self-loading, self-unloading... handles bulk materials automatically. With pallets, conveys parts up vertical runs.



**HERE'S  
HELP!**

**PIVOTED BUCKET Carrier**  
handles "problem" materials

Patented top loading device handles fragile crystalline materials with least particle breakage... also wet or dry, hot or cold, corrosive or non-corrosive powdered, lump or granular materials. Bucket lining may be sheet steel, monel, aluminum, fibre or stainless steel. Automatic unloading. Many types of circuits are possible.



### ENGINEERING AND TESTING SERVICE

Test Conveyors are available at the factory or for shipment to your plant, if unusual conditions require "on the spot" testing of your material. Hapman Conveyors are individually engineered to your job. Send details of your problem to Hapman for analysis and estimates by experienced engineers.

Write for Bulletin CE-954.  
**Hapman CONVEYORS, INC.**  
DIVISION HAPMAN DUTTON COMPANY  
KALAMAZOO MICHIGAN

In Canada: CANADIAN VICKERS, LTD., Montreal

**Spectrophotometers**.....Automatic recording spectrophotometers and run analyses practically unattended and with accuracies which exceed the best manual operation. Facts contained in File No. R-55-14.  
306A Beckman Instruments.

**Spectrophotometers**.....Double beam infrared spectrophotometer—fastest, most efficient instrument commercially available for recording of large numbers of spectra. Details in Bulletin No. 104.  
306B Perkin-Elmer Corp.

**Spectrophotometers, Flame**.....Makes available descriptive literature—an introductory folder on flame analysis with Beckman Models B & DU flame spectrophotometers. Find essential information in Bulletin No. 325.  
306C Beckman Instruments.

**Spectrophotometers, Recording**.....Used in examination of alkaloids, synthetics, drugs in human and animal body fluids, foreign constituents in drugs, heavy metals in plastics, etc. Offers Data File No. 96-14.  
306D Beckman Instruments.

**Spectroscopy**.....High resolution nuclear magnetic resonance spectroscopy for structure determination and identification of components in mixtures. Includes tabulation of gyromagnetic information. Publication 42.  
306E Varian Associates.

**Speed Control, Turbine**.....Offers new 30 p. fully illustrated bulletin, "Fundamentals of Turbine Speed Control," which clarifies operation of automatic speed control for steam turbines. No. H-21.  
306F Elliott Co.

**Switchboard Instruments**.....Illustrated, 24 p. on long scale switchboard instruments. Covers detailed information on operation, characteristics, specifications, dimensions, prices, etc., in Bulletin GEC-218C.  
306G General Elec. Co.

**Tachometers, Hand**.....Measures speed by resonance or vibration. Durable, no maintenance involved since no moving parts to be lubricated. Tells how series of tuned steel reeds indicate speeds. Bulletin 31-P8.  
306H James G. Biddle Co.

**Telemeters, Level & Pressure**.....Bulletin covers description & illustrations of transmitters & receivers, diagrams of installation arrangements, application & operating features. Request No. 230-K10.  
306I Builders-Providence.

**Temperature Monitoring Systems**.....Makes available detailed information on Signalarm—a temperature monitoring system composed of well-tested, standardized units—in company Bulletin No. 70-E.  
306J Thermo Elec. Co.

**Testing Machines**.....Describes testing machines of 55,000 lb. capacity... novel weighing system, construction, automatic operation, uses, etc. Illustrated. Manufacturer presents new Bulletin No. 4266.  
306K Baldwin-Lima-Hamilton.

**Testing Machines, Fatigue**.....Data on fatigue machines of 13,000 lb. capacity. Elevated temperature testing, principles of "constant-force" operation & specifications covered, in descriptive Bulletin 4214.  
306L Baldwin-Lima-Hamilton.

**Thermal Conductivity**.....Units for gas analysis. Applications, sampling, repairs, cell & filament specifications, prices, table of typical deflection values, accuracy, advantages, bibliography, etc. Bulletin TC-953.  
306M Gow-Mac Instrument Co.

**Thermocouples**.....Covers full line of products: bare wire thermocouple glands, packing glands, protection tubes, quick disconnect thermocouples, etc. 16 p. Illustrated Catalog No. 1530.  
306N Conax Corp.

**Thermocouples**.....Special design for special application... assures superior performance for thermocouples & thermocouple wire. Valuable selection data may be obtained in Bulletin GEC-714.  
306O General Elec. Co.

**Thermocouples**.....36 p. reference manual, "Thermocouples & Accessories" lists, with specifications, standard thermocouples for all applicable temperature ranges. Details in Bulletin No. 235-5.  
306P Foxboro Co.

**Thermocouples, Wire Type**.....One of many, standard thermocouples for taking process temperatures. Other kinds include tubular, bayonet immersion contact, exposed loop, etc. Offer Catalog 22E.  
306Q Thermo Elec. Co.

**Thermometers**.....Solve temperature checking problems and reduce thermometer costs. Feature multiple helix for better accuracy & all-metal construction for longer life. Request detailed literature.  
306R Weston Elec. Instrument.

**Thermometers, Dial**.....Details specifications & special features of various types of dial thermometers for industrial & laboratory use. Useful reference includes valuable information on accessories.  
306S Rochester Mfg. Co.

**Thermometers, Dial**.....Designed for long distance measurement. Data on temperature indicators of vapor & gas pressure types. Ball & trough movement, applications, installation methods, etc. Bulletin 467.  
306T Foxboro Co.

**Thermometers, Dial**.....Provide valuable features: climate-proof case; maximum response... minimum flutter; all welded stem construction; etc. Full data on precision-built thermometers in Bulletin 144.  
306U Manning, Maxwell & Moore.

**Thermometers, Electronic Resistance**.....Resistance thermometer operation over a complete range from -300F to 1200F made possible by development of a low-cost platinum resistance element. Bulletin 230-C.  
306V Bailey Meter Co.

**Thermometers, Remote Bulb**.....44 p. covers data on selection, recorders & indicators, pneumatic control, electric control, program control, bulbs, tubing & fittings. Catalog No. 6709 contains details.  
306W Minneapolis-Honeywell.

**Thermometers, Remote Reading**.....Mercury dial thermometers feature ruggedness, accuracy, sensitivity plus small dial diameter & short bulb length. Suitable where panel and mounting space is limited.  
306X U. S. Gauge Div.

**Transducers**.....Describes instruments for the measurement of gage, differential, and absolute pressures. Includes drawings, specifications, and selection tables, in 12 p. detailed Bulletin No. PT-1.  
306Y Statham Labs.

**Transformers, Instrument**.....96 p. illustrated Buyer's Guide with ratings. ASA accuracy classifications & prices of all indoor & outdoor potential & current transformers. Bulletin No. GEA-4626G.  
306Z General Elec. Co.

**Transmission, Instruments, Pneumatic**.....Pneumatic transmission instruments measure, indicate, record, & control pressure, temperature, vacuum, flow, differential pressure & liquid level. Detailed Bulletin.  
306AA Bristol Co.

**Transmitters**.....Features & operation of differential pressure primary element transmitter. Illustrated with hook-up & schematic diagrams, phantom-cutaway views, etc. Bulletin No. A-707-A.  
306BB Swartwout Co.

**Transmitters, Differential**.....Low-head type differential-pressure pneumatic transmitters designed particularly for measuring liquid fuels, & automatic control of fuel-air ratio. Refer to Bulletin No. 2753.  
306CC Hagan Corp.

**Transmitters, Electronic**.....Ideally suited to requirements of modern processing plant & power station. Ruggedly built for reliable performance under severe operating conditions. Catalog 400A.  
306DD Manning, Maxwell & Moore.

**Transmitters, Flow Signal**.....Describes heavy-duty pneumatic signal transmitters for use in measuring, indicating & controlling fluid flow & liquid level. Details in fully illustrated Bulletin No. 2553.  
306EE Hagan Corp.

**Transmitters, Flow Signal**.....Data on a combination 1500-psi liquid line-flow measuring element and pneumatic flow-signal transmitter. Operation, construction and use in manufacturer's Bulletin 2653.  
306FF Hagan Corp.

**Transmitters, Pneumatic**.....36 p. cover transmitters for measuring flow, pressure, level, density. Offer longer life, less maintenance, continuous accurate operation. Details in technical Data Book No. 1004.  
306GG Republic Flow Meters Co.

**Transmitters, Pneumatic**.....Combines Penn pneumatic transmitter with a high quality pressure gage for remote indicating, recording or controlling of pressures. Bulletin 1025 supplies full information.  
306HH Penn Industrial Instrument.

**Transmitters, Pneumatic**.....Force-balance rotameter float position transmitters for use with pneumatic receivers &/or control instruments. Operation, applications, advantages, dimensions, etc. Bulletin 170.  
306II Brooks Rotameter Co.

**Transmitters, Pneumatic**.....Describes basic types & differential pressure ranges in which Ashcroft pneumatic transmitter with differential pressure cell can be accurately supplied at extra high speed. Bulletin 330.  
306JJ Manning, Maxwell & Moore.

**Transmitters, Pneumatic**.....New pneumatic transmitters, suitable for outdoor unprotected installation, combine transmitting & indicating functions in one compact assembly. Catalog 1022.  
306KK Penn Industrial Instrument.

**Transmitters, Pneumatic Signal**.....Illustrates & describes the pneumatic signal transmitter designed especially for use with the Hagan ring balance meter. Applications, operation, etc. in Bulletin 9553M.  
306LL Hagan Corp.

**Transmitters, Pressure**.....For measuring fluids with positive seal between receiver & fluid. Includes operating features & advantages, specifications, installations, etc., in new reference. Catalog No. 4000.  
306MM King Engrg. Corp.

**Transmitters, Pressure**.....Can measure pressures within 1/4% of 20-40 psi shiftable range spans. Operate on simple force-balance principle. Includes valuable features and advantages in Bulletin 98097.  
306NN Taylor Instrument Cos.

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**Tubes, Pitot.**.....Describes pitot tube construction, installation, application and specification data on principles of operation. Includes list of accessories. Literature is illustrated in 8 p. Bulletin 51.  
307A Meriam Instrument Co.

**Tubes, Thermocouple Protection.**.....Covers properties & specifications & describes metal-ceramic thermocouple well—resistant to both air oxidation & combustion gases at high temperatures. Bulletin P1261.  
307B Bristol Co.

**Tubes, Venturi.**.....Primary devices used to produce pressure differentials from flowing liquids for purpose of actuating rate of flow meters. Built with elliptical throat design. Type VE 5-p. brochure.  
307C Simplex Valve & Meter Co.

**Tubes, Venturi, Miniature.**.....For measurement of fluids, either gaseous or liquid, in quantities ordinarily considered too low for application of a normal size Venturi or orifice. Type TF 5-p. brochure.  
307D Simplex Valve & Meter.

**Valve Operators, Automatic.**.....Feature greater torque, thrust & stem capacity; easier de-clutching; easier hand-wheel operations; 2-piece stem nut design; etc. Illustrated Bulletin for complete information.  
307E Phila. Gear Wks.

**Viscometers.**.....Presents a line of standard instruments for nearly every type of viscosity determination problem. Feature high accuracy & sensitivity. Details on all models & accessories. 1954 Catalog.  
307F Brookfield Engrg. Labs.

**Viscometers.**.....Sturdily built, precision instruments for recording or recording-controlling of viscosity in industrial plants. Covers design, operation, advantages, etc., in descriptive literature.  
307G Norcross Corp.

**Viscosity.**....."Article Reprint Request Sheet," on topic of determination & control, lists reprints of technical papers on viscosity & subjects related to the field. Reprints available by item number.  
307H Brookfield Engrg. Labs.

**Viscosity Measurement.**.....Ultrasonic systems for continuous viscosity measurement. Covers applications, operation, installation, characteristics, benefits, etc., in useful Data Sheet No. 10, 13-2a.  
307I Minneapolis-Honeywell.

**Waste Control Systems.**.....Control of discharge of harmful wastes into state and municipal sewer systems with specific detail and flow diagram. Package control system described. Application Memo 600-K2.  
307J Builders-Providence, Inc.

**Watches, Stop.**.....For industrial, medical, radio & research purposes. Precision time & motion study features. Coil-spring mechanism ends possibilities of wear, friction & failure. Description and specifications.  
307K M. Ducommun Co.

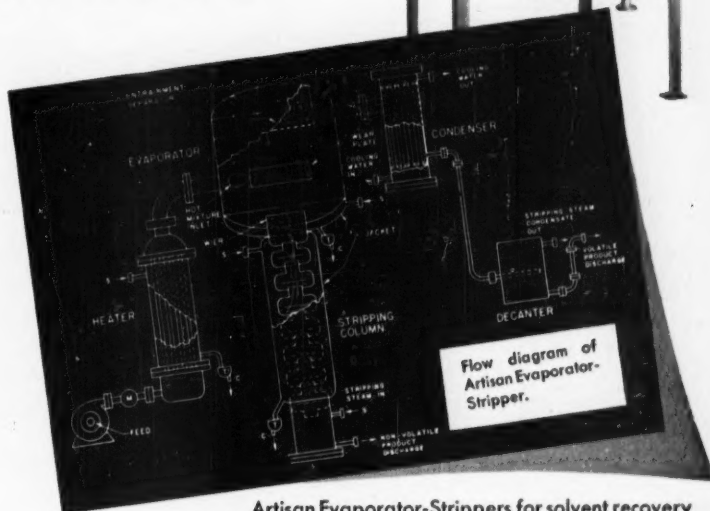
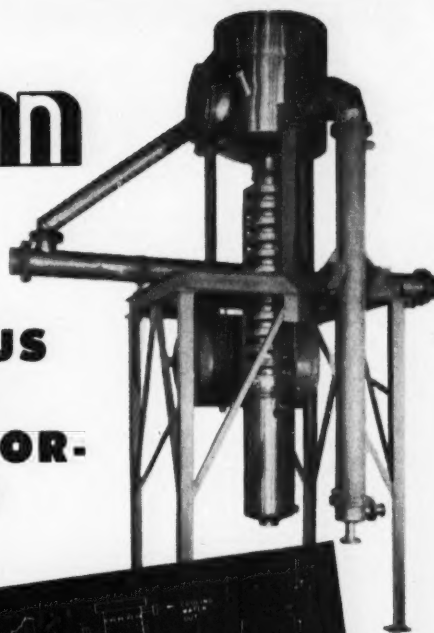
**Watches, Stop.**.....Stop watches & chronographs for time study in industry. Feature non-breakable coil spring mechanism for highest accuracy under rugged industrial applications. Request data.  
307L Herman H. Stich Co.

**Weighing Systems.**.....For measuring load, fluid pressure, or torque more accurately and economically. Offers Booklet No. 4106 covering tank weighing and Booklet No. 4105 with data on crane scales.  
307M Baldwin-Lima-Hamilton.

**Weighing Systems, Electrical.**.....Measure batch ingredients accurately... automatically. Provides complete details in Data Sheet 10.18-1a, "Unit Measuring Systems with Baldwin Electric Strain Gages."  
307N Minneapolis-Honeywell.

# Artisan

## CONTINUOUS COMBINED EVAPORATOR- STRIPPERS



Artisan Evaporator-Strippers for solvent recovery are designed to separate the volatile and non-volatile components of a liquid mixture — continuously and with high efficiency. Partial separation takes place in the evaporator and complete separation in the stripper. (See diagram.)

Every Artisan Evaporator-Stripper is custom-designed to fit the physical properties of the two liquids. They can be supplied in a wide range of sizes to handle anywhere from 25 to 1000 gallons per hour. Operation of the system is from atmospheric pressure to 29 inches of vacuum, depending on the characteristics of the liquids to be separated. Either manual or automatic control is available.

While Artisan Evaporator-Strippers are primarily used for solvent recovery, they have a much wider field of application and in many instances will eliminate the need for elaborate fractionation equipment.

If your problem involves the separation of two liquids, write us the pertinent details. No obligation.



Write for our bulletin PROCESS EQUIPMENT.

# Artisan

**METAL PRODUCTS, INC.**  
73 Pond Street, Waltham, Mass.



**Wells, Thermocouple.**.....New thermocouple protection tube combines thermal conductivity & shock resistance of metal with oxidation & deformation resistance of ceramics. Bulletin No. P1261.  
308A Bristol Co.

**Wires, Thermocouple.**.....Thermocouple & extension wires most often used for standard pyrometric work. Wires featured are those with plastic insulations, fiberglass insulations, etc. Bulletin 31.  
308B Thermo Elec. Co.

**Wires, Thermocouple.**.....Provides information on thermocouple and extension wires—sizes, accuracies, chemical compositions, weights and prices. Request illustrated 6 p. Specification Sheet 307.  
308C Minneapolis-Honeywell.

**X-ray Analysis.**.....For clinical laboratories. Discusses crystallography & X-ray diffraction, identification of compounds, X-ray spectroscopy & microradiography. References. Photographs & drawings. 12 p.  
308D North American Phillips Co.

**X-ray Units.**.....Describes portable X-ray units for industrial radiography. Feature high efficiency, quick setup, dust and waterproof mounting, light weight, economy, etc. Find details in Bulletin.  
308E Hoiger and Andreasen.

## Construction Materials

**Adhesives, Lagging.**.....30 p. Reference Manual covers data on lagging adhesives, sealers, surface coatings, fire retardant mastics and vapor barriers. Includes full technical products information. No. 545.  
308F Benjamin Foster Co.

**Alloy Products, Stainless.**.....Contains information on expansion joints, gas turbine power plants, ceramic coatings, shell mold castings, etc. for the oil & chemical industries. Illustrations included in booklet #PR-353.  
308G Solar Aircraft Co.

**Alloys.**.....Company makes available upon request a valuable "Alloy Reference Chart" . . . a 4 p. pamphlet listing alloy designations, applications, properties and analysis of corrosion and heat resisting alloys.  
263e Cooper Alloy Corp.

**Alloys.**.....Offers "Materials Selection Chart" . . . a 4 p. chart designed to assist in the selection of the most economical alloy for a given corrosive problem. More than 250 specific corrosives are included.  
263d Cooper Alloy Corp.

**Alloys.**.....High temperature characteristics . . . company announces the availability of an informative Technical Data Chart which furnishes high temperature characteristics of heat-resistant alloys.  
263i Cooper Alloy Corp.

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**Alloys, Cast High.**.....Discusses in detail cast corrosion-resistant alloys generally used for process equipment in the chemical industries. Also shows physical and mechanical properties of these alloys. 8p. Reprint.  
308H Cooper Alloy Foundry Co.

**Alloys, Cast Stainless.**.....Properties of cast stainless alloys . . . company offers a Technical Data Chart which gives designations, composition, mechanical and physical properties of cast stainless alloys.  
263j Cooper Alloy Corp.

**Alloys, Cast Stainless.**.....Molybdenum bearing stainless castings . . . company issues a valuable 4 p. Folder which discusses the properties and applications of molybdenum bearing cast stainless alloys.  
263k Cooper Alloy Corp.

**Alloys, Cupro Nickel.**.....Data on corrosion-resisting characteristics of iron-modified 90/10 cupro nickel alloy in sea water. Literature offered by company includes 50 charts, tables & illustrations. Bulletin A-170.  
308I International Nickel Co.

**Alloys, Hardfacing.**.....Illustrated, 48 p. catalog describes complete line of hardfacing and build-up rods and electrodes. Included are discussion of typical applications and complete description of properties.  
308J American Manganese Steel.

**Alloys, Hardfacing.**.....Superior resistance to corrosive agents, abrasion and scaling. Spraywelding method of application quick and economical. Data and helpful information in Hardfacing Manual.  
308K Wall Colmonoy Corp.

**Alloys, Nickel.**.....32 p. booklet with new illustrations and data, on the use of alloys to meet the requirements of improved design and modern methods of manufacture of railroad equipment. Form #12M6-53 2731 (2).  
308L International Nickel Co.

**Alloys, Nickel.**.....Descriptive literature contains valuable data on Monel. Strong, tough alloy handles acids, alkalis & salts with minimum of corrosion or contamination. Technical Bulletin T-5.  
308M International Nickel Co.

**Aluminum.**.....Due to long service life & low initial cost . . . aluminum has become one of the most popular metals in the chemical process industries. Details in "Alcoa Aluminum in the Process Industries."  
32-3d Aluminum Co. of America.

**Aluminum Products.**.....Makes available numerous technical handbooks. Each book is an authoritative reference on a single aspect of aluminum design or fabrication. Also includes fully detailed illustrations.  
308N Reynolds Metals Co.

**Asbestos.**.....For your most exacting insulation requirements. Tough—will not crack, crumble, powder. Designed for temperatures up to 1200°. Unaffected by water, vapor, fumes. Fully illustrated.  
255 Union Asbestos & Rubber.

**Blocks, Glass.**.....Offer numerous features: better daylighting; high insulation value; low surface condensation; privacy & protection; low maintenance costs; etc. Discussed in illustrated literature.  
308O Pittsburgh Corning Corp.

**Brass.**.....Literature outlines facilities for supplying brass rods, fabricated parts & other brass products quickly. Map of all depots, offices & agencies, & cities in which rod is warehoused & distributed.  
308P Titan Metal Mfg. Corp.

**Bricks, Floor.**.....Modernization of industrial flooring. Also includes descriptions of contracting services, floor bricks & shapes, joint filler, drains & floor plates. Varied applications. Bulletin M3.  
308Q Drehmman Paving & Flooring.

**Bronzes.**.....Description of these low shrinkage, heat treatable bronzes for machine component pressure & bearing castings. Applications & compositions. Tables and charts included. 12 p. Bulletin A107-8.  
308R International Nickel Co.

**Calculators, Alloy & Steel Weight.**.....New tool available provides weights of strips, sheets, bars & plates of various metals & alloys. Factors are given for steel, stainless steel, nickel, monel, inconel, aluminum, etc.  
308S Continental Copper & Steel.

**Calculators, Enamel.**.....Coal tar base enamel quantity calculator gives estimates for quantities of enamel required in lbs. per 1000 ft. & gals. per mile on 2 grades of primer. Tables of recommended temperatures.  
308T Reilly Tar & Chemicals.

**Calculators, Weld Strength.**.....Indicate both size of weld needed for given applied load & weight of given length of weld in lbs. Give values for stresses ranging from 2000 to 20,000 psi. Design data & formulas.  
308U Lukens Steel Co.

**Castings, High Alloy.**.....What type high alloy castings . . . company provides up-to-the-minute technical information—a 4 p. Folder which describes selection of alloy types in keeping with government regulations.  
263m Cooper Alloy Corp.

**Castings, High Alloy.**.....Information on castings designed for heat resistance, corrosion resistance, abrasion resistance. Describes how all are carefully tested in up-to-date laboratory. Bulletin 3150-G.  
308V Duraloy Co.

**Castings, Stainless Steel.**.....Production of these stainless steel castings are maintained to rigid standards by consistent laboratory control. New up-to-date booklet describes characteristics and applications.  
308W Waukesha Foundry Co.

**Castings, Stainless, Shell Molded.**.....Company makes available descriptive literature . . . 8 p. technical discussion which explains the development of a method for casting stainless steel in shell molds.  
263p Cooper Alloy Corp.

**Castings, Stainless Steel.**.....Cast stainless steel in the paper industry. Offers an 8 p. Folder which describes how stainless steel castings, valves & fittings are used to beat corrosion in the paper industry.  
263g Cooper Alloy Corp.

**Cements.**.....Offer outstanding advantages—acid & waterproof . . . abrasive & heat-resistant . . . chemically setting, etc. Data on most efficient methods of mixing in fully illustrated Bulletin.  
308X Robinson Clay Product Co.

**Cements.**.....Data on basic types of corrosion-proof cements & constructions. Cement shown in its relationship to temperature & the broad classes of corrosives handled. Resistance & estimating tables. Bulletin 5-2.  
308Y Atlas Mineral Products Co.

**Cements.**.....Describes a long-range investigation of the performance of portland cement in the making of concrete. Discusses work & aims & lists the member companies. 14 p. Bklt. E106-501M.  
308Z Portland Cement Assoc.

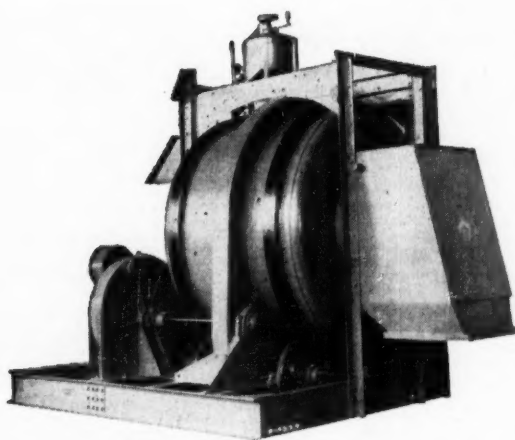
**Cements, Furan.**.....Data on a basically different furfural-ketone resin cement. Offers advantages common to all furan-type cements plus 6 important points of superiority as found in these particular cements.  
308AA Pennsylvania Salt Mfg.

**Cements.**.....Describes new pour-lay cement which resists corrosive acids, acid gases, salts, solvents & high temperatures. Includes cost-cutting & labor saving advantages, technical data, prices, etc.  
308BB Sauerleisen Cements Co.





## He can't stand that slow mixing cycle!



**THE MODERN WORTHINGTON CHEMICAL MIXER** is available in sizes up to 110 cu ft or 3 tons per batch. Each mixer is equipped with a measuring tank for various chemical applications.



But it isn't *that* bad, friend. Give us a chance to help. We've got a mixer that can boost your daily output as much as 10 per cent. It's the Worthington chemical mixer with an engineered blade design that gives you a mixing action faster than any we know of. It saves time with every batch, can be set up for continuous agitation, mixes thoroughly, and eliminates these other big problems as well:

**CORRODED DISCHARGE CHUTE**—The Worthington discharge chute is out of the mixer during mixing time. Proper balance makes manual control of chute easy. Pneumatic controls are also available.

**WOBBLY DRUM ROLLER**—Worthington drum rollers are of genuine carwheel metal, ground to close tolerances. Drum roller shafts are easily adjustable to compensate for wear.

**HEAVY HORSEPOWER CONSUMPTION**—Worthington's specially engineered, anti-friction construction assures peak operating efficiency with lowest possible horsepower consumption.

**SEND THIS COUPON TODAY** to learn more about how to reduce mixing time and cost with a Worthington chemical mixer. There's a skilled Worthington engineer near your plant. At your request, he'll be glad to call on you.

Worthington Corporation  
Industrial Mixer Division  
Plainfield, New Jersey

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Address .....

City.....Zone.....State.....

☐ I'd like more information. ☐ I'd like to talk with an engineer.

**Cements, Resinous Bonding.**.....Valuable data on new acid-proof, alkali-proof and solvent-proof synthetic resinous bonding cement which adds years to life of brick and tile structures. Clearly illustrated in literature.  
310A Celcote Co.

**Cements, Vinyl Resin.**.....Set hard in contact with wide variety of surfaces such as brick, tile concrete & a large number of metals including steel. Properties, storage, uses, etc. are considered. Bulletin 5-30E.  
310B Atlas Mineral Products Co.

**Clad Metal Products.**.....Describes new developments including the cupralum anode, ferrolum anode, lead-plate heater, universal pipe supporter, automatic lead cladding machine, lead-lube, immersion heater, gullider, etc.  
310C Knapp Mills.

**Coatings, Acid Proof.**.....Vinyl & butadiene styrene acidproof resin protection against acids, alkalis, as well as many solvent actions. Industry-wide usage. Fully illustrated in 4 p. Bulletin No. DK-1-53.  
310D Electro-Chem. Engrg.

**Coatings, Masonry.**.....Based on Bakelite & Vinylite resins for extended service life, reduced maintenance costs, beauty of appearance. Advantages, applications, results of service tests in 8 p. Brochure (VC).  
310E Bakelite Co. Div.

**Coatings, Phosphate.**.....Turcoating materials designed to fill phosphating needs with reference chart outlining purpose of phosphate coatings, methods of application & equipment required. 4 p. Pamphlet A-108.  
310F Turco Products.

**Coatings, Protective.**.....Neoprene based, & provide surface which is inert & impervious to broad range of corrosives in fume or splash form. Also resist acids, alkalis, oils, etc. Bulletin 7-55E.  
310G Atlas Mineral Products Co.

**Coatings, Protective.**.....Combines qualities needed for use on concrete in corrosive service. Less costly than using acidproof brick. Describes its applications on concrete & similar surfaces. Bulletin A-50.  
310H Carboline Co.

**Coatings, Protective.**.....Stonelike acid-proof coatings for floors, walls, tanks, trenches . . . provide superior protection for concrete surfaces. Includes details and thoroughly outlined specifications. Bulletin 110.  
310I Celcote Co.

**Coatings, Protective.**.....Check list of metal protective & paint bonding chemicals & processes. Data on protective coating chemicals for paint-bonding on steel, zinc, aluminum, etc. offered in literature.  
310J American Chem. Paint Co.

**Coatings, Protective.**.....Coating systems developed to combat the primary causes of coating failure. Includes vinyl, phenolic, chlorinated rubber & fish oil formulations. Further details found in Bulletin MC-7.  
310K United Chromium.

**Coatings, Protective.**.....Valuable guide helps effect substantial savings on maintenance costs. Discusses correct coating selection methods & covers surface preparation as well as most efficient application techniques.  
310L Amercoat Corp.

**Coatings, Protective.**.....Protection for walls, beams & equipment exteriors. Large variety offered for special needs as well as for general protection against corrosive fumes & splash. Bulletin 7-2 offered.  
310M Atlas Mineral Products Co.

**Coatings, Protective.**.....Advantageous characteristics & uses of protective coatings for general protective & severe corrosive service. Also discusses tank linings. Properties & applications. File No. 351-991.  
310N Nukem Products Corp.

→ Want a copy of any of these literature items? Just circle its code number on one of the postcards beginning on p. 35, then mail to us. It's that easy now.

**Coatings, Protective.**.....High solids content neoprene base coatings for protective service. Thorough consideration of advantages, physical properties, application technique, corrosion resistance, etc. Bulletin 700.  
3160 Carboline Co.

**Coatings, Protective.**.....Gives complete information on base formulation . . . adhesion . . . abrasion resistance . . . chemical characteristics . . . film thickness and cost as adapted to special conditions. 8 p. Brochure No. 150.  
310P Celcote Co.

**Coatings, Protective.**.....Performance & generally recommended applications of silicone-based protective coatings. Resistant to thermal or chemical change. Describes three main groups of finishes. Data Sheet 7-100.  
310Q Dow Corning Corp.

**Coatings, Protective.**.....Synthetic rubberized base coatings are highly resistant to acids, alkalis, and corrosive chemicals which normally cause deterioration of metal, concrete, wood, etc. Descriptive literature.  
310K Earl Paint.

**Coatings, Protective.**.....Use of Bakelite resin coatings result in decreased maintenance costs, extended service life and many other advantages for industry. Details carefully outlined in Folder VG.  
3108 Bakelite Co. Div.

**Coatings, Protective.**.....Gives details about new product described as paint, plaster, color & texture combined in one protective coating. Advantages, application data & color charts available in two bulletins.  
310T Enterprise Paint Mfg.

**Coatings, Protective.**.....Makes available a new illustrated Bulletin which describes the uses and application of the first air-curing, liquid neoprene protective coating. Simplicity of use described in GACO-N-700 bulletin.  
310U Gates Engrg. Co.

**Coatings, Protective.**.....Successful use of protective coatings based on chlorinated rubber portrayed in 35 case histories. Performance data on finishes & application instructions included. 20 p. Illustrated.  
310V Hercules Powder Co.

**Coatings, Protective.**.....For thermal insulation or corrosion prevention. Feature flexibility, tough fillers which absorb physical abuse, mica which reflects harmful rays of sun, etc. Offers Catalogue.  
310W Insul-Mastic Corp.

**Coatings, Protective.**.....Specially formulated from coal-tar pitch base. Stop corrosion caused by moisture-acid fumes-alkaline fumes-corrosive soil-salt air-heat. Offers complete set of informative booklets.  
310X Koppers Co.

**Coatings, Protective.**.....Valuable technical data on neoprene sprayed coatings & sheet linings. Outlines protective qualities in applications affected by sunlight, heat, abrasion, oil, cold, chemicals, etc.  
310Y Metalweld, Inc.

**Coatings, Protective.**.....Superior protection against corrosives. Application of coatings to plant structures & equipment results in effective preventive maintenance. Advantageous qualities in Bulletin MC-6.  
310Z United Chromium.

**Coatings, Protective.**.....Includes information on an air-curing liquid neoprene coating that produces a thickness of at least 5 mils with 1 primer & 2 top coats. Specification sheets & literature.  
310AA Pennsylvania Salt Mfg.

**Coatings, Protective.**.....Information on sprayable, heavy-bodied liquid vinyl plastic. Used for waterproofing & for protection against rust & corrosion. Describes tensile strength, elasticity, adhesion, cohesion, etc.  
310BB Protective Coatings.

**Coatings, Protective.**.....Company presents valuable treatise on rust prevention. Features 94 color chips of Rust-Oleum products and instructions for surface preparation and application. Offered in 20 p. Form 253.  
310CC Rust-Oleum Corp.

**Coatings, Protective.**.....When correctly used, protective coatings outlast & outperform practically any coating on the market. Performance data under various corrosive conditions listed in Bulletin 750.  
310DD U. S. Stoneware Co.

**Coatings, Protective.**.....A new Bulletin on corrosion-resisting coating, lining and surfacing materials, applies new classification methods to help corrosion and material engineers. Request Bulletin No. 100.  
310EE Carboline Co.

**Coatings, Protective.**.....Explains system of custom-made protective coatings. System gives positive protection to both old & new structures, & to structural materials & industrial equipment. 16 p.  
310F Rowe Paint & Varnish Co.

**Coatings, Protective.**.....Covers properties, uses & application methods of rust-proofing, corrosion-resistant mastic coating for exteriors of tanks, vats, ducts & structural work. Fully illustrated.  
310FF Palladium Mastic Corp.

**Coatings, Protective.**.....Primers, coatings & trim recommended in complete Tanx protection system. . . & data on surface preparation, priming & application of finish & trim coats. Technical Bulletin 5310.  
310GG General Paint Corp.

**Coatings, Protective Plastisol.**.....Toughness & chemical resistance often permit ordinary steel or cast iron to be used satisfactorily under corrosive conditions in place of expensive stainless. Bulletin VP-1.  
310HH United Chromium.

**Coatings, Resin Base.**.....For petroleum industry. Specific applications include sucker rods, well-head corrosion, offshore drilling operations, etc. Case histories, test results, industrial applications in 8 p. Brochure.  
310II Bakelite Co. Div.

**Coatings, Resin Base.**.....For chemical industry. Specific applications include tank cars, oil pipe, acid tanks, shipping containers, etc. Tabulates effects of chemicals on vinyl resin-base coatings in 8 p. Brochure.  
310JJ Bakelite Co. Div.

**Coatings, Rust Preventive.**.....Pure zinc or aluminum coatings offer protection against atmospheric corrosion. Coatings are mechanically bonded to surface & last many years without maintenance. Bulletin 62B.  
310KK Metco Systems.

**Coatings, Zinc.**.....Metallic zinc preserves iron & steel against rust. Discusses history & theory behind zinc-rich coatings, applications in marine, industrial & welding fields, practical results, etc. in Bulletin 1001.  
310LL Sealube Co.

**Construction.**.....Emphasizes role of construction in industrial advancement & expansion. Describes wide assortment of applications. Also operations in marine salvage & derrick heavy hoisting. 28 p.  
310MM Merritt-Chapman & Scott.

# U.S.I. CHEMICAL NEWS

Fall

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

1954

## NATIONAL DISTILLERS FORMS NEW CHEMICAL DIVISION

### ATTENTION

#### National Distillers, U.S.I. Announce Change of Head Office Address

National Distillers Products Corporation, and U. S. Industrial Chemicals Co., a division of National, have announced the relocation of their head offices, formerly at 120 Broadway, New York 5, N. Y. The new address is 99 Park Ave., New York 16, N. Y. and the telephone number is OXford 7-0700.

#### Renew Taxfree, Specially Denatured Alcohol Permits

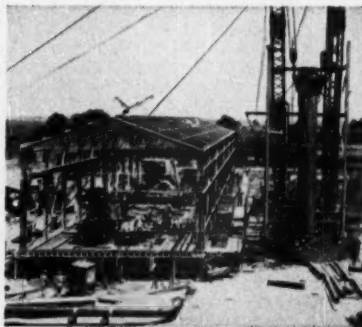
Now is the time for users of specially denatured alcohol to renew their basic permit (Treasury Department Form 1479) for 1955. It is also time for users of Taxfree alcohol to complete and file with the Assistant Regional Commissioner — Alcohol and Tobacco Tax Division — their application (Form 1450) for renewal of their Taxfree Alcohol permit for 1955. If you require forms or any assistance in their preparation, please call your nearest U.S.I. office.

#### Consolidation of All Chemical Activities Paves Way for Future Expansion in the Chemical Field

#### U.S.I. Continues as the Selling Organization for National Distillers' Chemical Products

All chemical activities of National Distillers Products Corporation have been integrated into a single Chemical Division, National officials announced recently. This consolidation is just one part of National Distillers' long range program for future growth and development in the chemical field. Other phases of the program include centralization of research at Cincinnati, Ohio, and a greater emphasis on bulk industrial chemicals — where National has competitive advantages by virtue of low cost integrated facilities well situated as to markets.

The new Chemical Division is enthusiastically carrying out the company's expansion program and by December 1954, it is estimated National will have a \$70 million investment in chemical plants with 85% of this capacity less than 5 years old.



A typical example of National's expansion plans is this ammonia plant being built at Tuscola, Ill. Capacity will be 60,000 tons/year.



New "National Distillers Building" at 99 Park Ave. will house all of National's N. Y. Offices.



Aerial view of gigantic National Petro-Chemicals plant at Tuscola, Ill. Located on a 500-acre plant site, its hydrocarbon extraction and fractionation units are the largest in the world. Further expansion of facilities at this location will include a polyethylene plant, an ammonia plant, an alcohol denaturing plant.

#### U.S.I. the Sales Organization

Integration of chemical activities will combine the operations of U. S. Industrial Chemicals Co. and National Distillers Products Corporation. U.S.I. however, will continue as the sales and distribution organization for National Distillers. The U.S.I. name will still be used for product lines and labels; and U.S.I. sales offices, division managers and salesmen will continue to serve their customers as before.

The Chemical Division will also carry on activities for National Petro-Chemicals Corp., but that company will maintain its corporate identity.

**MORE**



Fall

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# U.S.I. CHEMICAL NEWS

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1954

## CONTINUED

### Move Into New Offices

The Chemical Division is located in the new "National Distillers Building," 99 Park Ave., N. Y., to which it moved on August 16. All of National Distillers' and U.S.I.'s New York offices recently moved to this modern building.

Arrangement of offices and selection of equipment were made with maximum convenience and efficiency in mind. The latest in telephone equipment and a battery of teletype machines were installed, the latter linking sales offices and plants.

### Expansion of Operations

National Distillers has already announced its intent to expand operations and facilities in certain fields. Other expansion plans will be announced at later dates. Present plans call for continuation and expansion in the following fields—

(1) **Metallic sodium and derivatives**, such as ethyl acetoacetate and the related compounds, the arylides, and isobacetic acid. Isobacetic acid, a new product developed by National's research laboratory, has properties similar to adipic acid and will find use in the production of synthetic lubricating oils, polyamides and other synthetic resins and plasticizers. Commercial production of isobacetic acid will start in 1955. National produces 50 million pounds of metallic sodium per year at its Ashtabula, Ohio, plant.

(2) **Raw materials for the fertilizer industry**, such as sulfuric acid, ammonia, and nitrogen solutions. The Company's four sulfuric acid plants have a capacity of over 1,000 tons per day. Ammonia production will be boosted to 60,000 tons per year by mid 1955.

(3) **Petrochemicals**, available through a 60% owned subsidiary, National Petro-Chemicals Corp. These products include ethyl alcohol, ether, and ethyl chloride. Polyethylene production is scheduled for early next year. Facilities have been modified to provide the extremely pure ethylene required for high quality polyethylene.

(4) **Alcohol, alcohol derivatives and solvents**. With synthetic ethyl alcohol from National Petro-Chemicals and with fermentation plants at New Orleans, La., and Anaheim, Calif., National Distillers expects to be completely integrated in alcohol and derivatives. New de-

## Methionine Increases Riboflavin Yields

Methionine has been found to increase yields of riboflavin obtained through fermentation methods. There was a dependency of the organisms producing riboflavin on some part of the sulfur-bearing amino acid. Additions of methionine also brought about even greater yields of vitamin B<sub>2</sub> when supplemented with L-histidine.



Aerial view of National's sodium plant at Ashtabula, Ohio, which produces 50 million pounds of metallic sodium per year.

naturing plants will be built at Newark, N. J., and Tuscola, Ill.

(5) **Feed Supplements**. The company will continue to manufacture and market to the pharmaceutical and animal feed trade such products as methionine; Vitamins A, D<sub>3</sub> and K<sub>2</sub>; riboflavin; calcium pantothenate; niacin; vitamin B<sub>12</sub>; antibiotics; and distillery by-products.

(6) **Chlorine and caustic soda**. National Distillers has 2 plants at Huntsville, Ala., producing these heavy chemicals.

Research activities are being centered in Cincinnati, in a recently expanded laboratory building. A new pilot plant is also being built there. This new laboratory and pilot plant set-up will provide ample facilities for National Distillers' many continuing chemical research projects.

For more information on National Distillers' chemical products write to the Editor, U.S.I. Chemical News.

## TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

**A reusable aerosol container** which can be refilled by the consumer has been announced. Carbon dioxide is used as a propellant and design features are said to make this pressure-type container adaptable for use with new compounds and package designs. (No. 1060)

**New type carbon paper for pen or pencil** reportedly produces fresh copy that cannot be smudged. Described as long wearing with improved manifold properties, it produces a number of legible copies with little pressure. (No. 1061)

**Sealed-in decorative effects** in compression molded plastic products such as laminated sheets, jar tops, and jewelry boxes now can be produced for the first time in this country by means of a new process. (No. 1062)

**A package that prevents spoilage** in transit of temperature-sensitive materials has been developed. Designed for shipping living tissue-culture cells, this thermally insulated package also can be used for pharmaceuticals and other items affected by temperature extremes. (No. 1063)

**A silicone water repellent for masonry** is said to be more effective on brick than any previous material. It reportedly retards cracking, reduces maintenance, and prolongs useful life and natural appearance of brick and concrete surfaces. (No. 1064)

**A non-acid rust removing material** can simultaneously strip paint, rust and primer from ferrous metal surfaces in one operation according to the manufacturer. Requiring only 2 simple steps—a dip and a pressure rinse—it eliminates need for multi-tank installations. (No. 1065)

**A solvent-cleaner and odor suppressant** is said to be highly effective either for dissolving and removing tars, gums, waxes, and oils or for controlling disagreeable odors from refuse areas, sewage plants, etc. (No. 1066)

**A lacquer for architectural aluminum** has excellent weather and ultraviolet resistance plus film toughness, clarity, and flexibility according to recent reports. (No. 1067)

**A light stable polystyrene** for use in light fixtures, signs, etc. reportedly offers light stability 8 to 10 times better than that of general purpose polystyrene but retains characteristic chemical and physical properties of the general purpose material. (No. 1068)

**A furniture touch-up kit** hides nicks and marks and makes it easy to do a professional job of blending with every wood shade. (No. 1069)

## PRODUCTS OF U.S.I.

### ALCOHOLS

Butanol (Normal-Butyl Alcohol)  
Fusel Oil — Refined

### Ethanol (Ethyl Alcohol)

Specialty Denatured—all regular and anhydrous formulas  
Completely Denatured—all regular and anhydrous formulas  
Pure—190 proof U. S. P., Absolute—200 Proof  
Solox®—proprietary solvent—regular and anhydrous

### ETHERS

Ethyl Ether, U. S. P.  
Ethyl Ether, Absolute—A.C.S.

### ACETONE—A.C.S.

#### ANOLS

Ansol® M  
Ansol® PR

#### ACETIC ESTERS

Butyl Acetate  
Ethyl Acetate—all grades  
Normal-Propyl Acetate

#### OXALIC ESTERS

Diethyl Oxalate

#### OTHER ESTERS

Diatol®  
Diethyl Carbonate

### INTERMEDIATES

Acetoacetanilide  
Acetoacet-ortho-chloroanilide  
Acetoacet-ortho-toluidide  
Acetoacet-para-chloroanilide  
Ethyl Acetoacetate  
Ethyl Benzoylacetate  
Ethyl Sodium Oxalacetate

### FEED PRODUCTS

Calcium Pantothenate (Feed Grade)  
Choline Chloride Products  
Curbay 8-G\* 80  
DL-Methionine (Feed Grade)  
Niacin, U.S.P.  
Riboflavin Concentrates  
Special Liquid Curbay®  
U.S.I. Vitamin B<sub>12</sub> and  
Antibiotic Feed Supplements  
Vacatone® 40  
Vitamin A, D<sub>3</sub>, and K<sub>2</sub> Products

### OTHER PRODUCTS

Anhydrous Ammonia  
Caustic Soda  
Ethylene  
Liquid Chlorine  
Metallic Sodium  
DL-Methionine (Pharm.)  
N-Acetyl DL-Methionine  
Nitrogen Solutions  
Propionic Acid  
Sulfuric Acid  
Urethan, U.S.P.

\*Reg. U.S. Pat. Off.

# U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

99 PARK AVENUE, NEW YORK 16, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

**Construction, Materials of.**.....30 p. with complete information on materials of construction shown to be satisfactory for chlorine dioxide production and bleaching processes. Special interest to design & corrosion engineers.  
313A Atlas Mineral Products Co.

**Construction, Materials of.**.....Acid-proof construction for chemical, steel, food & textile industries. Manufacturers of acid & alkali-proof cements, linings and coatings. Engineering & construction services also available.  
313B Electro Chem. Engrg.

**Copper & Copper Alloys.**.....Illustrated, 47 p. contains technical data on copper & copper alloys. Covers quality and service of complete company line of coppers, brasses, bronze alloys, nickel alloys, etc.  
313C Revere Copper & Brass.

**Corrosion & Abrasion Control.**.....Product offers protection for all types of metal equipment. Includes information on factory & field applications of rubber or synthetic linings to any metal parts or products.  
313D Goodall Rubber Co.

**Electric Furnace Shapes.**.....Literature covers electric furnace refractories—cores, tubes, muffles—of Alundum or Crystolon materials. Tells in detail how to construct electrical furnaces for laboratory. Bulletin 458.  
313E Norton Co.

**Fabrication, Alloy Metals.**.....Fabricates such metals as stainless steel, monel, everdur, nickel, Inconel, herculoy and aluminum into hundreds of products used by the process industries. Description & examples of products.  
313F Littleford Bros.

**Fabrication Facilities.**.....Facilities for custom fabrication of process industry equipment in standard & special alloys. Data on sizes & types of production equipment & also on transportation. Bulletin 16.  
313G Quaid Fabrications.

**Fabrication, Industrial Equipment.**.....Modern facilities geared to meet needs of industrial development & expansion. Include manufacture of heavy machinery, medium & heavy plate-work, etc.  
313H Treadwell Construction Co.

**Fabrication, Metal.**.....Manufactures metal products for many industrial uses... from complete carbon-black plants to steel conveyor boxes. Designs, engineers & fabricates to specific requirements.  
313I Boardman Co.

**Fabrication, Metal.**....."Facilities and Products" with explicit data & photographs which show why company can turn out—at low cost—specialized heavy equipment for chemical process plants.  
313J Newport News Shipbuilding.

**Fabrication, Metal.**.....Illustrated 46 p. book portrays extensive metal fabricating and production facilities, products and services, capacity to serve industry, over-all operation. Each phase treated separately.  
313K R. C. Mahon Co.

**Fabrication, Metal.**.....Complete fabricating & assembling facilities for any type, size & quantity of sheet & plate products & weldments thru 1/2" thickness. Brochure available on plant as well as products.  
313L Kirk & Blum Mfg. Co.

**Fabrication, Plate.**.....Includes complete information on manufacturing equipment, welding procedure qualifications. Also covers typical examples of plate and heat exchanger fabrication, etc.  
313M Downintown Iron Wks.

**Fabrication, Process Equipment.**.....Permanite corrosion-resistant equipment low in cost & economical in operation. Its light weight offers speed & facility in handling, shipping, erecting. Illustrated literature available.  
313N Maurice A. Knight.

**Fabrication, Process Equipment.**.....Complete modern facilities including X-ray inspection & stress relieving which insure quality control. Equipment in all commercial metals & alloys. Data in Catalog 490.  
313O L. O. Koven & Bro.

**Fabrication, Process Equipment.**.....Designed & built around use of Haveg—basic construction material that resists corrosion. Literature includes size & chemical resistance charts. 64 p. illustrated Bulletin F-6.  
313P Haveg Corp.

**Fabrication, Process Equipment.**.....Facilities permit company to fabricate everything from glassed steel to alloys and clad materials. Heat-treating furnaces among largest. Bulletin No. 902-AA-4.  
313P Pfaunder Co.

**Fabrication, Stainless Steel.**.....Specialists in stainless steel fabrication, with manpower trained, experienced and equipped for the work, increase service life of stainless steel processing equipment. Purchasing guide offered.  
313P S. Blickman.

**Fabrication, Steel & Alloy Plate.**.....Bulletin covers plant data, facilities, material range, scope of fabrication, personnel and engineering service. Illustrates types of industries served and company's experience.  
313Q Gussett Boiler & Welding.

**Fabrications.**.....Specializing in corrosion-proof and self-supporting material for superior service under adverse plant and processing conditions. Technical data on structures in Bulletin 9-1.  
313R Atlas Mineral Products Co.

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**Insulation.**.....Makes available 40 p. illustrated Industrial Products Catalog with data on insulations, refractory products, asbestos-cement pipe, packings, gaskets, roofing, siding, flooring, etc.  
313Y Johns-Manville.

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313Z Pittsburgh Corning Corp.

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**Insulation, Pipe.**.....Data on new lightweight one-piece pipe insulation. Covers application, thermal resistance, permanence, resiliency, non-corrosive properties, etc. Literature is informatively illustrated.  
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313EE Gustin-Bacon Mfg. Co.

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313GG Lead Industries Assoc.

**Lead Products.**.....Lead as specified for efficient control of corrosives. Provides all common mill shapes, sizes & forms... sheet, pipe, fittings, valves, etc. New Booklet on "Chemical Lead Products."  
313HH National Lead Co.

**Lead Products.**.....Illustrated, 44 p. comprehensive compilation of data on lead & lead products. Covers advantages of lead as construction material, describes grades, sheet lead, lead pipe & fittings, etc.  
313II Federated Metals Div.

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314E Klem Chem.

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314G Metalweld, Inc.

**Metals, Perforated.**.....36 p. describes round, square, oblong & ornamental perforations, ranging from .02" to 9.5" in diameter. Hole sizes, open areas, edge limits, varied applications, etc. Catalog 39 offered.  
314H Diamond Mfg. Co.

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314I Mycalex Corp. of America

**Monel, Cast.**.....Uses for cast monel—company makes available upon request up-to-the-minute technical information...an 8 p. Booklet which fully describes the properties and applications of cast monel.  
2631 Cooper Alloy Corp.

**Paints.**.....Carboline Rustbond Primer ties corrosion-resisting finishes securely to corroded steel. Easy to apply, excellent coverage. Describes rigid tests made on Primer in industry. Bulletin 150.  
314J Carboline Co.

**Paints.**.....Bulletin offered by company describes new patented dirt repelling paint, "Staize-Clene." Flat enamel odorless paint stays clean from 79 to 90 percent longer than most paints. Literature offered.  
314K Enterprise Paint Mfg. Co.

**Paints, Aluminum.**.....Feature added protection, long life, greater hiding capacity, greater light reflectivity, etc. Ideas for most efficient usage of this paint in new Aluminum Painting Handbook.  
314L Metals Disintegrating Co.

**Paints, Anti-Rust.**.....For use on all metal surfaces & applied with a minimum of surface preparation. Resist temperature changes by expanding & contracting with metal surfaces. Detailed explanation Bulletin 55319-R.  
314M Speco Inc.

**Paints, Metallic Zinc.**.....Makes available a descriptive booklet containing pertinent information on MZP—metallic zinc paint. Shows how used effectively for structural steel and galvanized surfaces.  
314N American Zinc Institute.

**Paints, Protective.**.....Proven successful against all forms of corrosion (corrosive fumes, condensates and spillage). Includes performance record with over 175 corrosives described in detailed Bulletin 750.  
314O U. S. Stoneware Co.

**Pellets, Plastic.**.....Discusses advantages of plastic pellets in an asphalt-rock mixture for industrial flooring. Pellets used in two types of flooring materials—characteristics of each type described. 8 p. "Plastic Pellets."  
314P Flash-Stone Co.

**Plastic Sheets.**.....Feature high impact strength dimensional stability as well as low moisture absorption, good heat resistance. Offers fast low cost forming. Literature describes application & specifications.  
314Q Campeo Div.

**Plastic Sheets.**.....Clear cast thermoset plastic sheets feature high abrasion and heat resistance, toughness and solvent resistance. Applications, properties, and fabrication data are clearly outlined.  
314R Cast Optics Corp.

**Plastics.**.....Makes available 114 p. fully illustrated guide for working in plastics, including suggested list of materials, equipment and supplies. Also contains samples of numerous plastic products.  
314S Fry Plastics Co.

**Plastics.**.....Tygon plastic offers superior flexibility & corrosion-resistance. Technical data on use of Tygon in its various forms, is supplied by manufacturer in convenient reference binder.  
314T U. S. Stoneware Co.

**Plastics.**.....Series of bulletins describes lines of casting resins, plastic foam, & other RF & microwave insulation materials. Thorough coverage of physical & electrical properties in literature.  
314U Emerson & Cuming.

**Plastics.**.....Company makes available a new set of technical literature containing a series of tables which give in clear form the chemical & physical properties of fifteen different plastics in company line.  
314V Atlas Mineral Products.

**Plastics, Foamed.**.....28 p. with charts, graphs, photos, outlines uses as a building material, advantages, applications & physical properties. Includes stress, compression, tension, density, testing procedures, etc.  
314W Nopco Chem. Co.

**Plastics, Industrial.**.....Information on manufacture, grades, properties, fabrication & use of laminated plastic sheets, tubes, rods & special shapes. Technical details & data in illustrated Bulletin.  
314X Joseph T. Ryerson & Son.

**Plastics, Molding.**.....Booklet which is offered by company describes acetate molding materials available in 6 different formulation series compounded to meet a range of ASTM flow characteristics. Illustrated, 16 p.  
314Y Celanese Corp. of America.

**Plastics, Phenolic Molding.**.....20 p. with properties, test values, molding techniques, applications. Gives five types—general purpose, improved impact, heat-resistant, low-loss electrical, special purpose. Booklet M-1.  
314Z Bakelite Co. Div.

**Plastics & Resins.**.....Literature contains latest information about more than 50 Bakelite & Vynilite plastics & resins, their properties & uses. Contains 50 photographs showing applications & finished products.  
314AA Bakelite Co. Div.

**Plastics & Textiles.**.....Informatively illustrated 42 p. outlines company's history, organization, policies & benefits. Discusses how the company operates in the 3 basic fields of textiles, chemicals & plastics.  
314AB Celanese Corp. of America.

**Plastics, Thermosetting.**.....Clear, transparent, scratch & abrasion resistant sheet material, developed from thermosetting resins, offers high optical & mechanical properties. Advantages & details in Bulletin 1052.  
314CC Homalite Corp.

**Platinum Clad.**.....Includes technical data on how it is made, thickness of platinum cladding, test for imperfections, heat exchange equipment, pyrolysis tubes, tube sizes & connections, linings for vessels, etc.  
314DD Baker & Co.

**Platinum Cladding.**.....Pure platinum—or a suitable precious metal alloy—bonded throughout to a base metal support. Shows how the corrosion resistance of platinum can be available at reasonable cost. Booklet 96.  
314EE Baker & Co.

**Platinum, Gold & Silver.**.....Makes available Folder C-20, "Platinum, Gold & Silver for Science, Industry & the Arts" & Folder C-21, "Platinum & Palladium Catalysts." Showing variety of uses of these materials.  
314FF American Platinum Wks.

**Polymer Directory.**.....Buyers Guide gives interesting information on sources of "Kel-F" polymer materials, finished products, as well as application services offered by more than 75 U. S. and Canadian companies.  
314GG M. W. Kellogg Co.

**Radiation Shielding.**.....High density homogeneous alloy of tungsten, nickel & copper fabricated by special powder metallurgical methods. For use as efficient radiation shielding material. Properties. Form 6-9.  
314HH P. R. Mallory & Co.

**Refractories.**.....Makes available folder containing brief description of refractory products and their industrial applications for...chemical, ceramic, metals, etc. industries. Covers information on comparative properties.  
314II Norton Co.

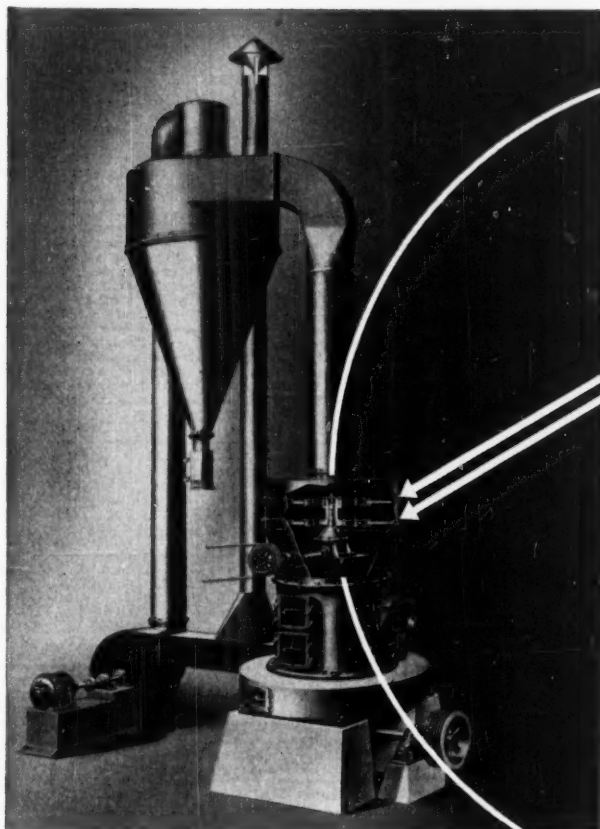
**Refractories.**.....Company announces new, 16 p. fully illustrated tour book which graphically describes the only completely integrated processing facilities for the manufacture of basic refractories.  
314JJ Kaiser Aluminum & Chem.

**Refractories.**.....32 p. aids in selection of proper refractory products for critical areas in boilers for heat & power. Data on characteristics & manufacture of refractories. "Norton Refractories for Heat & Power."  
314KK Norton Co.

**Refractories.**.....No other refractory is so chemically stable at high temperatures under both oxidizing and reducing conditions. Includes detailed information on properties in Bulletin No 1409.  
314LL Norton Co.

**Refractories, Silicon Carbide.**.....Offer many features: tested crushing strength of over 10,000 psi at 2500°F; safe to use up to 3000°F; withstand abrasive/erosive wear-&-tear far better than metals; etc.  
314MM Carborundum Co.





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316F Rochester Ropes.

**Rubber Linings**.....Rubber linings on chemical equipment help solve corrosion problems & reduce down-time. Literature shows rubber applications to equipment, parts and installations in every industrial field.  
316G Automotive Rubber Co.

**Rubber Products**.....Covers facilities for producing quality rubber products through engineered compounds in literature offered by major producers of O-rings for hydraulic & pneumatic design applications.  
316H Goshen Rubber Co.

**Rubber, Synthetic**.....Up-to-Date Bulletin aids in selection of elastomers that withstand oils & solvents, effects of aging, extreme low temperatures. Uses, compounding, typical properties. Illustrated 4 p.  
316I Thiokol Chem. Corp.

**Selectors, Stainless Steel**.....For fast, accurate selection of stainless steels. Also offers valuable data on physical or mechanical properties, resistance to corrosion or scaling, machinability characteristics, etc.  
316J Crucible Steel Co.

**Selectors, Tool Steel**.....Derived from a new method for the selection of tool steels designed on the fundamental basis that the application dictates the choice of tool steel. Explicit instructions given in literature.  
316K Crucible Steel Co.

**Sheeting & Film, Acetate**.....High quality thermoplastic materials made from cellulose acetate in a wide range of widths, lengths, thicknesses, formulations. Includes list of properties, as well as suggested applications, etc.  
316L Celanese Corp. of America.

**Sheets, Galvanized**.....For industrial roofing & siding. Feature low initial application, & per-year costs; discusses rust protection of zinc; strength of steel; etc. Detailed booklet provides helpful reference.  
316M American Zinc Institute.

**Sigma Formation**.....Interesting discussion of sigma formation & its effect on impact properties of iron-nickel-chromium alloys. Study of this brittle, metallic compound. Graphs & tables. Bulletin A-154.  
316N International Nickel Co.

**Silicone Rubber**.....Heat & aging-resistant features, with typical applications. Products described are diaphragms, oil seals, sheet packing, gasketing, rings, insulation tape, etc. Details in Bulletin No. A13-141.  
316O GAFKOR PACKING Co.

**Silicone Rubber Paste**.....Shows superior handling characteristics. Discusses advantages of maximum abrasion resistance and good dielectric properties for coating glass cloth or organic fabrics. Applications.  
316P Dow Corning Corp.

**Silicone Rubber Stock**.....Easy-to-handle, fully compounded molding material for gaskets, O-rings, seals, diaphragms, bellows, etc. No toxic additives. Literature available in complete advantages and properties.  
316Q Dow Corning Corp.

**Slide Charts**.....Information on steel casting material selection. Handy reference data on 19 carbon & low alloy grades & 17 stainless & corrosion-resistant grades. Offered in comprehensive literature.  
316R Lebanon Steel Foundry.

**Steel Analyses**.....Company presents corrosion and heat resisting steel analyses chart. A valuable reference tabulation of stainless steel analyses as produced by various manufacturers. Bulletin No. 333.  
316S Globe Steel Tubes Co.

**Steel Hardening, Stainless**.....Offers illustrated, 64 p. reference on the method of hardening precision stainless steel parts. Hardens parts to estimated 2,000 Brinell without change in physical quality.  
316T C. U. Scott & Son.

**Steels, Aluminized**.....Aluminized steel features valuable advantages: resists high temperatures; resists products of combustion; reflects heat. Complete data on these features presented in "Armco Aluminized Steel."  
316U Armco Steel Corp.

**Steels at Low Temperatures**.....Provides bibliography on low temperature characteristics of steels with author index. 468 United States and foreign articles, translations, books, etc. 48 p. Bulletin A-157.  
316V International Nickel Co.

**Steels, Stainless**.....44 p. general catalog covers stainless steels, lists their applications, sizes & forms, & resistance to various corrosive media. Also includes data of technical significance on properties.  
316W Armco Steel Corp.

**Steels, Stainless**....."Armco's ELC Stainless Steels", a new informative booklet, presents data on 2 extra-low carbon stainless steel grades that are fully satisfactory for service in welded equipment up to 800F.  
316X Armco Steel Corp.

**Steels, Stainless**....."Stainless Steel & Textiles" presents story of stainless steels as they can be used in textile processing. Facts are backed by test data on average corrosion rate of different stainless types.  
316Y Armco Steel Corp.

**Steels, Stainless**.....Will reduce shut-down time and add to equipment life. Pertinent information on corrosion resistance, properties, performance results, application and fabrication, in descriptive Bulletin.  
316Z Carpenter Steel Co.

**Steels, Stainless**.....Story of stainless steels in the fiery applications, with suggested procedure for selection of right grade. Illustrated booklet, "Armco Stainless Steels for Heat Resistance" offered by company.  
316AA Armco Steel Corp.

**Steels, Stainless**.....Skilled workers using specialized equipment produce stainless steel plate & other stainless components to highest chemical industry standards. Request the Carlson Weekly Stock Lists.  
85a G. O. Carlson, Inc.

**Steels, Stainless**.....36 p. includes descriptions indicating where stainless is used in pulp and paper industries plus descriptive information on the technology of Allegheny Metal. Literature is completely illustrated.  
316BB Allegheny Ludlum Steel.

**Steels, Stainless**.....Company makes available pertinent up-to-date information in their 28 p. fully-illustrated "Fabrication Manual," "Drawing, Forming, Spinning and Cutting of Armco Stainless Steels."  
316CC Armco Steel Corp.

**Steels, Stainless**.....Data on superior stainless steel sheets, strip, bars, plates, wire, forgings, etc. Details in informative booklet, "Making the most of Stainless Steels in the Chemical Process Industries."  
316DD Crucible Steel Co.

**Steels, Stainless, Austenitic**.....Covers corrosion-resisting properties in 32 p. with 18 tables. Included are tests on austenitic stainless steels in various solutions...acid, neutral & alkaline. Bulletin No. A-49.  
316EE International Nickel Co.

**Steels, Stainless, Welding**.....Furnishes upon request a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels"—the latest & one of the most concise articles ever written on the subject.  
316FF Armco Steel Corp.

**Steels, Stainless, Welding**....."Welding & Soldering of Armco Stainless Steels" covers all types of welding, lists electrode and filler rod recommendations for the standard types of Armco stainless steels. 52 p.  
316GG Armco Steel Corp.

**Surfacing, Hard**.....Explains specialized metallizing method which combines metal-spraying & torch-fusing for simplified, high-speed application of super-hard surfacing alloy. Also gives advantages & applications.  
316HH Metallizing Engrg. Co.

**Surfacing Materials**.....Presents Bulletin on acid, alkali, solvent-proof topping for floors, walls, acid holding tanks, waste disposal systems, etc. Includes information on applications and corrosion-resistant properties.  
316II Celcote Co.

**Tantalum Equipment**.....Immunity to hydrochloric, nitric & perchloric acids, iodine, bromine, etc. eliminates shut-downs, repairs, lost production time, spoilage, fume damage & other costly corrosion results.  
316JJ Fansteel Metallurgical Corp.

**Teflon Sheets, Cementable**.....Offers pertinent information on chemical, electrical & physical properties, typical uses. Also includes suggestions on application & bonding agent selection, etc., in Catalog MF-443.  
316KK United States Gasket Co.

**Titanium**.....Shows resistance to chloride solutions & retains useful strength up to 800-1000F. Offered literature also includes other advantages & data on application & fabrication of titanium alloys.  
316LL Rem-Cru Titanium Corp.

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**Tungsten Carbide, Cemented.**.....Describes advantages for balls & seats in subsurface pumps used in petroleum industry. Data on abrasion corrosion, impact resistance, composition, manufacture. Bulletin B-100.  
317A General Elec. Co.

**Tungsten Carbide Components.**.....Product manufactured in accordance with customer's specifications. Photos ranging from pieces as small as 1 gram to those weighing 18 lbs. Illustrate variety of shapes, sizes & forms.  
317B Sintercast Corp.

## Pipe, Fittings, Valves

**Bellows, Metal Expansion.**.....For conveying gas & liquids. Explanation of how bellows welded diaphragm construction helps withstand extreme temperature, vibration & corrosion. Specifications. Illustrated Bulletin 300.  
317C Titeflex Inc.

**Calculators, Vacuum.**.....Makes available new vacuum calculators for rapid slide-rule vacuum calculations. Includes a standard ABCD log scale. Helps determine the proper pump for a specific process.  
317D F. J. Stokes Mach. Co.

**Calculators, Valve Size.**.....New slide-chart calculators quickly estimate pressure drop and indicate proper size steam valve needed for any pressure up to 1500 psi. Includes technical information.  
317E Golden-Anderson Valve.

**Calculators, Valve Size.**.....Manufacturer of diaphragm control valves now makes available upon request a new valve size slide rule calculator which also includes valuable information on low flow data.  
317F Kieley & Mueller, Inc.

**Clamps, Pipe Repair.**.....Pipeline leaks repaired permanently in seconds. Installation for single & double repair clamps. Complete ordering specifications & price list offered in 6 p. Folder 201.  
317G Morris Coupling & Clamp.

**Connections, Swivel Air.**.....Slash pressure drop at the connection to only 5%. Shows how used for air hose coupling on paint spray guns & other air-operated equipment. 360-degree swivel action. Bulletin Q-D.  
317H Binks Mfg. Co.

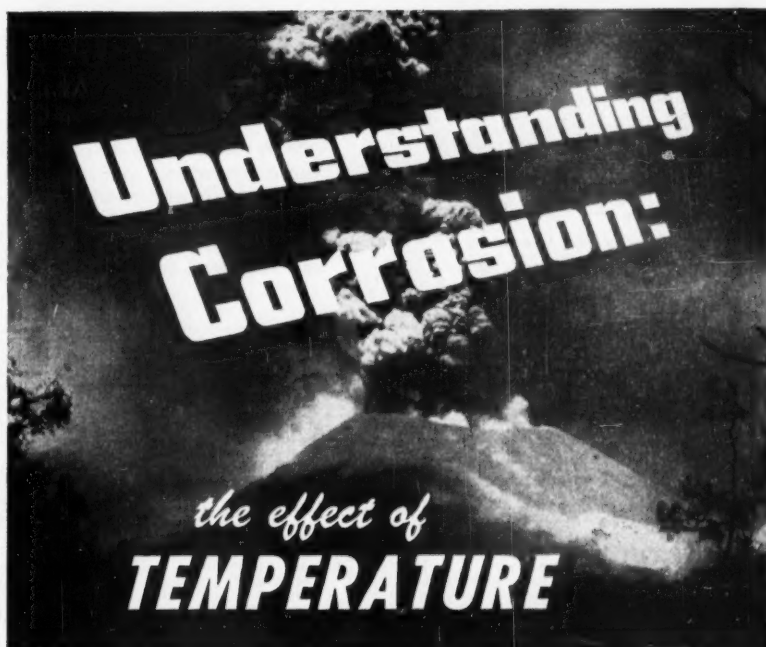
**Connectors, Duct.**.....Can be adapted to many industrial applications for handling of difficult fluids and air under critical conditions of temperature and pressure. Complete information in Data Sheet No. 1102R.  
317I Rubber Teck.

**Coupling Products, Pipe.**.....Information on fast, flexible, efficient pipe coupling products. Description of couplings for plain end pipe, couplings and precision fittings for grooved pipe, etc. Details upon request.  
317J Gustin-Bacon Mfg. Co.

**Elbows, Long Tangent.**.....Offer many advantages: save pipe; often eliminate short nipples and the need for extra welds; save time and money in lining up and clamping pipe and fitting, etc. Catalog 54.  
317K Midwest Piping Co.

**Elbows, Welding.**.....Covers 4 different types of welding elbows. Large selection gives engineer greater latitude in piping design & permits improvements & economies not otherwise possible. Details in Catalog 48.  
317L Midwest Piping Co.

**Fittings.**.....Offers Klinger Master Catalog describing the complete range of products...compressed asbestos sheets, packing for all purposes, valves, cocks, level gages, synthetic and silicone rubbers.  
317M Klinger Corp. of America



Temperature exerts a large influence as a determinant of the corrosion rate of metal, with the nature of the metal and its environment, and the degree of temperature and duration of exposure operating as governing factors. It does so primarily by influencing the variables that determine the supply of dissolved oxygen at the metal surface. In closed water systems from which oxygen cannot escape, weight loss approximately *doubles* for every 60°F. rise in temperature. In open systems, despite a decrease in oxygen concentration, the corrosion rate likewise increases rapidly with temperature because of the speed-up of oxygen transfer to the metal, the maximum being reached at about 175°F. and decreasing thereafter to practically zero at the boiling point. In acid solutions, temperature rise also markedly accelerates corrosion while in alkali solutions, on the other hand, a comparable increase generally has a retarding effect, with the concentration of the alkali a determining factor.

Among other effects are greater localization of corrosion as temperature raises electrical conductivity of electrolytes, increased pitting as hotter metal becomes anodic to cooler, and less natural protection as temperature alters physical nature of corrosion products — effects that further establish temperature as a factor to be thoroughly explored in assessing any corrosion problem.

For metal serving at elevated temperatures Dampney coatings have long provided uniquely successful protection... whether under wet heat as in boilers and steam turbines (Apexior Number 1) or dry heat to 1600°F. (Dampney silicones, ceramics). Other Dampney materials (vinyls, chlorinated rubber, asphalts) serve admirably at more moderate temperatures. Let us tell you more about these materials and the possibilities they offer in terms of your own corrosion control needs.



150-1

HYDE PARK, BOSTON 36, MASSACHUSETTS





**Fittings.....** Quikupl—impartial analysis... company provides an informative 4 p. Folder which objectively evaluates line of Quikupl fittings. Reference prepared by an independent engineering consultant.  
263e Cooper Alloy Corp.

**Fittings.....** Manufacturer announces availability of a new, hard cover 304 p. general catalog (55) which provides data on seamless welding fittings, forged flanges & forged steel fittings. Illustrations, dimensions, etc.  
108-9a Ladish Co.

**Fittings, Cast Steel.....** Company provides immediate shipment of fittings from large stock of standard sizes. Save time in ordering by using convenient selection charts and figure numbers in new Catalog 153.  
318A J. B. Bealrd Co.

**Fittings, Corrosion-Resistant.....** 24 p. covers pipe, tubing & welding fittings. Sections on special metals & alloys, grades & finishes, size & length tables, wt. tables, dimensional charts, tolerances, etc. Illustrated.  
318B Stainless Welded Products.

**Fittings, Corrosion-Resistant.....** Especially designed for use with light-wall pipe. Tangential section reduces initial costs & simplifies piping installations. Types, size ranges, test data, dimensions, charts, etc.  
318C Horace T. Potts Co.

**Fittings & Flanges, Welding.....** Illustrated, 50 p. includes information on welding procedure & data on stainless steel welding elbows, returns, tees, crosses, reducers, lap joint stub ends, laterals, caps, flanges, etc. TT600-10.  
318D Tube Turns.

**Fittings, Flare.....** These fittings have been proven absolutely leakproof even under the most severe conditions of vibration, high pressure & temperatures. Available in wide range of shapes & sizes. Catalog 4306.  
318E Parker Appliance Co.

**Fittings, Forged Steel.....** Drop-forged for high strength & toughness—the right combination of properties to withstand pressure, heat, shock, vibration & erosion. Description in informative Bulletins.  
318F Watson-Stillman Fittings.

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346 Camco Products.

**Fittings, Pipe.....** Describes light weight alloy welding & flanged fittings. Includes welding fitting properties, characteristics & general dimensions, & description of lap joint stub ends, elbows, tees, crosses, etc. 25 p. Booklet.  
318G Robinson Corp.

**Fittings, Stainless Steel.....** Quikupl stainless steel fittings... company furnishes valuable Technical Manual which describes the design, applications & limitations of revolutionary new type stainless fittings.  
263a Cooper Alloy Corp.

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318H Parker Appliance Co.

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318I Imperial Brass Mfg. Co.

**Fittings Tube.....** Specifically designed for applications involving extreme temperatures, corrosion conditions or wherever permanently welded tubing joints are needed. Complete information provided in Catalog 4370.  
318J Parker Appliance Co.

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318K Tube Turns.

**Fittings, Welding.....** Manufacturer provides a complete range of quality stainless steel butt welding fittings in Schedule 5—10—40 & tube O. D. Sizes from 1/2" thru 24" & 3/8". Complete information in Catalogs 748, 1051.  
318L Tri-Clover Div.

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**Fittings, Welding.....** Company describes manufacture, uses, new fitting sizes, revised engineering & application data. Thin wall, light gage stainless fittings available in elbows, tees, crosses, reducers, etc. 19 p. Catalog 735.  
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27 Midwest Piping Co.

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318R Flexonics Corp.

**Hose, Metal, Flexible.....** Highly adaptable product designed to fulfill practically unlimited engineering uses—simplifies design, construction, operation & maintenance. Types of hose, fittings, etc. in 48 p. Catalog 200.  
318S Titeflex, Inc.

**Hose, Metal, Flexible.....** Complete description of varied applications for flexible metal hose & tubing. Shows how tubing is designed, used & installed. Specifications also explained, in Booklet No. CC-400.  
318T American Brass Co.

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318X Quaker Rubber Corp.

**Hose, Water.....** Provides complete working information on the many types of water hose available. Includes photos, cutaway sections, tables of sizes, working pressures & weights, etc. in Illustrated Bulletin.  
318Y Quaker Rubber Corp.

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318AA Barco Mfg. Co.

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318BB D. W. Onan & Sons.

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318CC U. S. Gasket Co.

**Joints, Expansion.....** Provides the basic selection & installation data necessary to proper application of flexible metal hose & pipeline expansion joints. Low & high pressure unit specifications. Catalog CMH-128.  
318DD Flexonics Corp.

**Joints, Expansion.....** Data necessary to proper selection & application. Types of pipe-line motion & methods of handling. Guidance & anchoring of installations. Low & high pressure specifications. Offers Catalog 133. 8 p.  
318EE Flexonics Corp.

**Joints, Expansion.....** 24 p. with engineering application & selection data for solution of pipeline expansion problems. Contains schematic piping layout as well as complete list of the types available. Catalog 135.  
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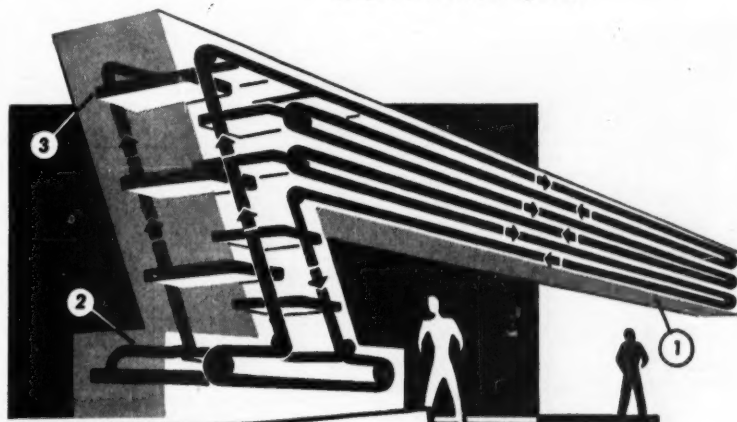


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320B Corning Glass Wks.

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320E Naylor Pipe Co.

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320F Republic Steel Corp.

**Pipe, Seamless & Welded.**.....Brochure aids in selection, application & installation of carbon, alloy & stainless steel pipe. Includes information on dimensions, weights, specifications, analyses, etc. in TDC 138A.  
320G Babcock & Wilcox Co.

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**Pipeline Branch Connections.**.....A 52 p. discussion of the problem of making branch connections to highly stressed transmission & distribution lines without interruption of fluid flow. Illustrated Bulletin No. 533.  
320J Taylor Forge & Pipe Wks.

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320K Taylor Forge & Pipe Wks.

**Piping.**.....This complete brochure covers data on wood-lined steel, saran rubber-lined steel, wood stave and fabricated piping products... for water, corrosive liquids, chemical gases, pulps, slurries, etc. Illustrated.  
320L Michigan Pipe Co.

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320M American Brass Co.

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320N Jenkins Brothers.

**Piping Layouts.**.....Gives information on planning an industrial waste treatment system. Includes description & enlarged diagram of practical piping layout with additional detailed data. Piping Layout No. 70.  
320O Jenkins Bros.

**Piping Layouts.**.....Also provides pertinent data on planning a sulphate pulping process system. Includes an enlarged diagram of practical piping layout along with detailed description. Piping Layout No. 72.  
320P Jenkins Bros.

**Piping Systems.**.....Technical Bulletin contains more than 5,000 pressure-temperature ratings of various grades of pipe in common use in power plants. Ratings arranged for easy reference. No. TB1-1953.  
320Q Pipe Fabrication Inst.

**Porcelain Products, Chemical.**.....The manufacturer is prepared to supply a complete line of chemical porcelain pipe, fittings, spacers, vertical check valves, hand-wheel valves, plug valves, swivel joints, etc. Bulletin CP-50.  
320R U. S. Stoneware Co.

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320U American Brass Co.

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**Tubing.**.....In order to insure the quality of its product, the company has performed stress rupture tests and creep tests on a great number of tubing steels. Offers literature references TDC 102 & TDC 153.  
320W Babcock & Wilcox Co.

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320X Carpenter Steel Co.

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320Y Trent Tube Co.

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32-3a Aluminum Co. of America.

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320Z Penna. Flexible Metallic.

**Tubing & Pipe.**.....The brochure which the company supplies contains data on variety of quality tubing—ornamental, mechanical & heat resisting, pressure, sanitary, shaped, etc. Lists applications for each type. Illustrated.  
320AA Wallingford Steel Co.

**Tubing & Pipe.**.....Technical data on 14 tubing steels used in high-temperature or high-pressure service. Analyses, mechanical & physical properties, green strength, oxidation resistance, applications, etc. Folder TDC 163.  
320BB Babcock & Wilcox Co.

**Tubing & Pipe.**.....Notes & formulas for calculation of maximum allowable working pressures. Tabulates maximum allowable stress values. Complete information on Data Card No. TDC 154.  
320CC Babcock & Wilcox Co.

**Tubing & Pipe.**.....Especially designed and constructed for corrosion-resistance applications. Offers data on comparative corrosion-resistance of stainless steels to corrosive media in 8 p. Technical Data Card 160.  
320DD Babcock & Wilcox Co.

**Tubing, Plastic.**.....New plastic tubing offers unusual flexibility and clear transparency. The factual brochure provided by the manufacturer includes properties, chemical resistance, characteristics, etc. Bulletin 66-D.  
320EE American Hard Rubber Co.

**Tubing, Plastic.**.....Glass-clear, fully flexible & light in weight. The special properties of plastic tubing are its resistance to acids, alkalis, oils, greases, certain solvents & water. Presents descriptive Bulletin 77.  
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320GG Arthur S. La Pine & Co.

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320HH Trent Tube Co.

**Tubing, Stainless Steel.**.....Flexible stainless steel tubing developed to facilitate the movement of a very wide variety of searching & corrosive liquids & gases at high temperatures. Illustrated Bulletin STC-1.  
320II American Brass Co.

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320JJ Globe Steel Tubes Co.

**Tubing, Stainless Steel.**.....Stainless steel tubing provides economical, trouble-free service over long periods of use. Offers price calculator for full price data & weight per foot of tubing size & grade you need.  
320KK Trent Tube Co.

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321A Clayton Mark & Co.

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263h Cooper Alloy Corp.

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321C Wm. Powell Co.

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321D Kerotest Mfg. Co.

**Valves.**.....Figure number cross reference chart... company supplies descriptive literature upon request—a 4 p. Folder which shows equivalent figure numbers of the five leading stainless steel valve producers.  
263q Cooper Alloy Corp.

**Valves.**.....Extremely versatile Y valves in corrosion service throughout the chemical industry where tight shut-off is required. Provides full information with illustrations in descriptive Bulletin V/7.  
321E Duriron Co.

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321F Crane Co.

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321G Greenwood Valve.

**Valves.**.....Socket & butt welding end dimensions approved by the American Welding Society. Four diagrams provide explanation of standard preparation of valve butt welding ends. Bulletin 507.  
321H Edward Valves.

**Valves.**.....Getting the most out of your valves... furnishes valuable information—detailed, 4 p. technical discussion explaining selection, installation, inspection, and maintenance of stainless steel valves.  
263r Cooper Alloy Corp.

**Valves.**.....Easily operated, non-lubricated, maintenance-free valves reduce down time and costs. Built of corrosion-resisting alloys with a teflon sleeve. Company makes available Durco Valve Bulletin V/4.  
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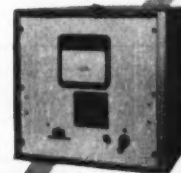
**Valves.**.....8 p. Folder gives data needed to enable manufacturer, supply company or sales representative to fit the proper valve for the application. Tells buyer how to get what he needs when ordering a valve.  
263t Cooper Alloy Corp.

**Valves.**.....Lubricant-sealed in order to ensure positive shut-off. Valves are available in a wide range of sizes, pressures, special metals and body designs for the process industries. Bulletin V-217.  
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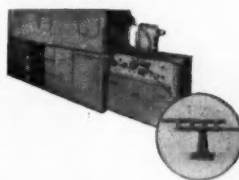
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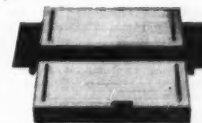
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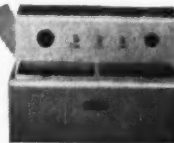
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322A Crane Co.

**Valves.**.....Company makes available up-to-the-minute technical information—a valuable 8 p. Folder listing detailed specification for 150# corrosion resistant cast flanged valves, flanges and flanged fittings.  
263a Cooper Alloy Corp.

**Valves.**.....Quick selection of the proper valve is made sure and easy by the OIC catalog digest. Information on various kinds of valves in bronze, iron, cast steel, forged steel, stainless steel is included.  
322H Ohio Injector Co.

**Valves.**.....36 p. provides valuable information on valves for use on storage tanks & tank cars. Designed for long life, dependability, safe functioning, ease of maintenance & servicing. Available on request.  
322C A. C. F. Industries.

**Valves.**.....Latest data on dependable valves, filters & driers for air conditioning & refrigeration industry. Covers automatic expansion valves, water regulating valves, etc. Air Conditioning-Refrigeration Catalog.  
322D A-P Controls Corp.

**Valves.**.....Built for use in conjunction with light weight pipe & fittings. Complete weldments from rolled plate—eliminating porous areas & insuring proper thickness where designed. Folders offered.  
322E Fabri-Valve Co. of Amer.

**Valves.**.....A 48-page brochure provided by the manufacturer covers valves extensively used on guided missiles, aircraft, military automotive equipment and for general industrial application. Catalog No. 500.  
322F Robertshaw-Fulton.

**Valves.**.....Data on prices and critical dimensions for bonnet stock and bonnetless stock valves, wedge gate valves, swing check valves, butterfly valves, etc. are supplied by a comprehensive booklet.  
322G Fabri-Valve Co. of Amer.

**Valves.**.....52 p. Catalog, divided into sections on magnetic, check, regulating special valves, includes applications, specifications, installation drawings, flow curves, detailed illustrations, etc.  
322H Marotta Valve Corp.

**Valves.**.....Gives features, application information, and specifications on valves for instrument piping and general use. New literature also includes numerous photographs and diagrams. Data Unit 234.  
322I Jerguson Gage & Valve Co.

**Valves.**.....Provides detailed literature—a 4 p. Folder which describes basic stainless steel valve designs in terms of fluid flow. The uses and limitations of each major type are discussed. Fully illustrated.  
263e Cooper Alloy Corp.

**Valves, Air.**.....Describes operation, discharge capacities, uses, weights & dimensions. Pictures of air valve in open & closed positions. Graphs & diagrams also included in 4 p. Bulletin 1203.  
322J Simplex Valve & Meter Co.

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**Valves, Air, Wobble-Rod.**.....New flexibility in automatic, semi-automatic & manual control of pneumatic circuits is assured by these air valves. Includes applications, specifications, price data in Bulletin 61861.  
322M Pantex Mfg. Corp.

**Valves, Anhydrous Ammonia.**.....Presents a new, 16 p. fully illustrated catalog describing the entire line of anhydrous ammonia valves and steel fittings for soil fertilization and industrial uses. No. 802.  
322N Henry Valve Co.

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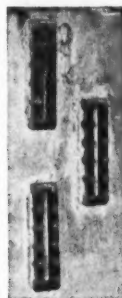
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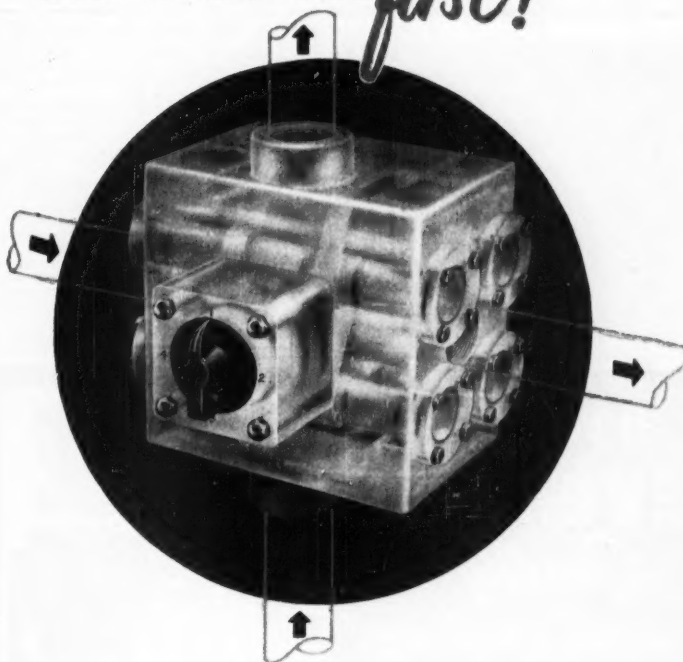
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326Q Reliance Elec. & Engrg. Co.

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326R Okonite Co.

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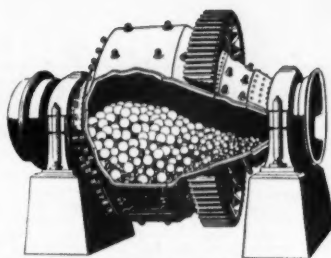
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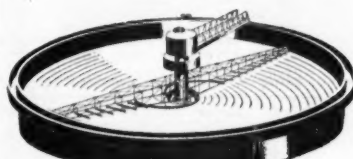
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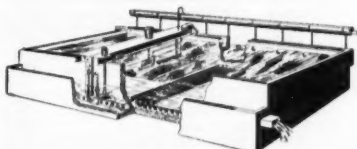
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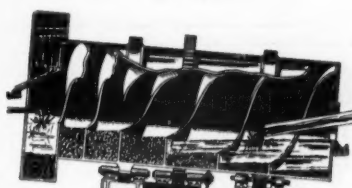
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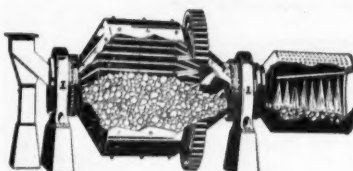
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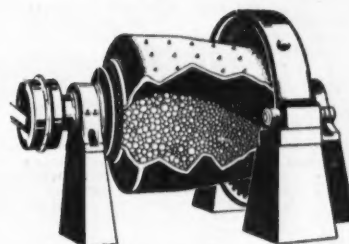
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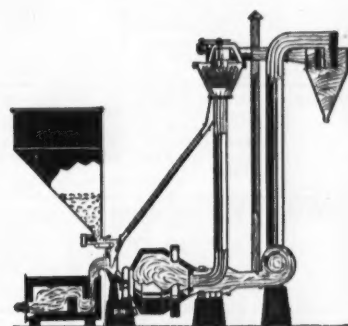
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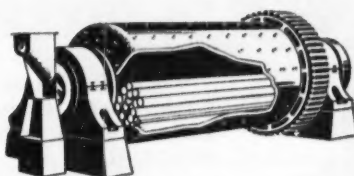
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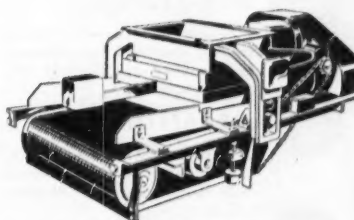
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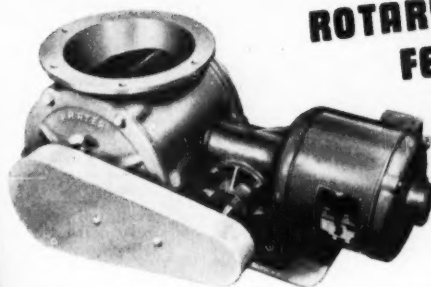
**Balls, Steel.....**Literature on chrome steel balls, stainless steel balls, etc. Lists applications for bearings in armatures, valves and pumps, as casters, burnishing balls, gage, crushing and grinding balls. 331K Frazar & Co.

**Bearings.....**Company issues bearing application evaluation chart... specifically designed to enable engineers to evaluate their bearing functions with respect to 17 different service requirements. 331L Thomson Industries.

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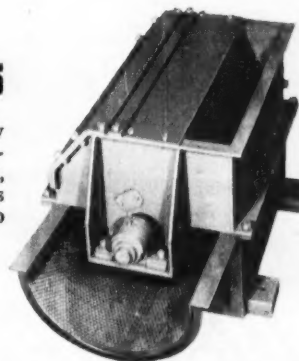
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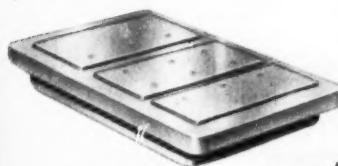
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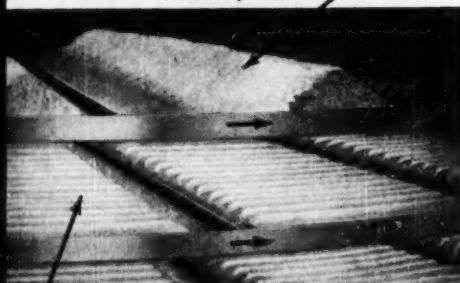
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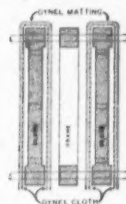


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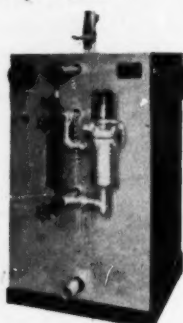
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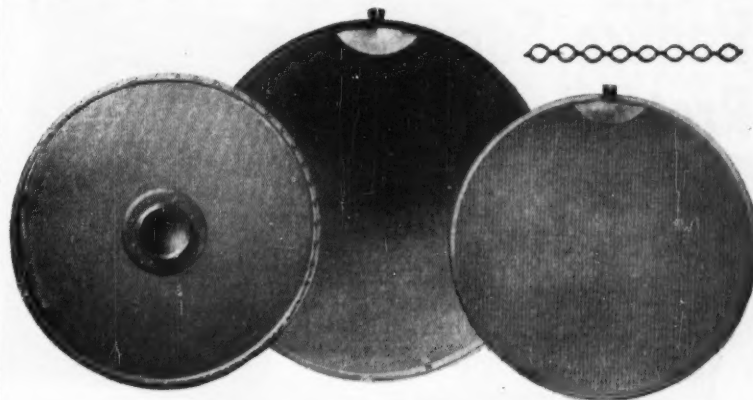
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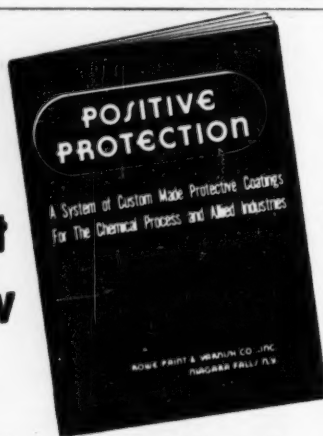
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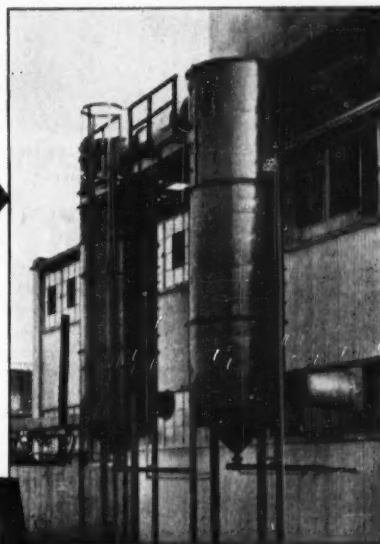
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340G National Radiator Co.

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340U Edwin L. Wiegand Co.

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340V Edwin L. Wiegand Co.

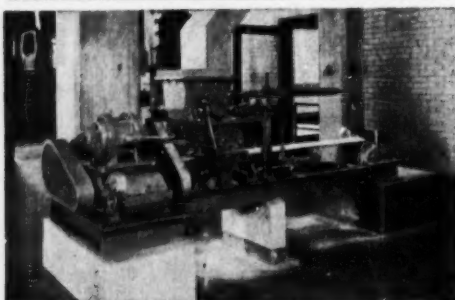
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340W Hynes Elec. Heating Div.

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**341B** General Elec. Co.

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**341F** Struthers-Wells Corp.

**Heating, Electrical . . . . .** Explanation of proper & efficient application of electrical heating elements & devices. Specifications for wide variety of applications. Handy application guide. Illustrated, 29 p. Catalog 53.  
**341G** Heatube Corp.

**Heating & Steam Generating . . . . .** Offered literature includes information on tank car heaters, bituminous boosters, steam boilers, etc. Contains specifications & typical installation pictures in bulletin Form AD-109.  
**341H** Cleaver-Brooks Co.

**Heating Systems, Dowtherm . . . . .** Furnishes descriptive information on Dowtherm heating systems for processes requiring precision control of high constant temperatures at low pressures, in Bulletin ID-54-5.  
**53F** Foster Wheeler Corp.

**Heating Systems, Dowtherm . . . . .** Illustrated 28 p. includes useful engineering data, 136 different types and sizes to choose from, nine different complete system layouts, etc. Bulletin A-100.  
**341I** Eclipse Fuel Engrg. Co.

**Heating Units, Electric . . . . .** Company literature describes methods of electrically heating liquids, air, gases, machine parts, process equipment in 32 p. illustrated booklet, "101 Ways to Apply Electric Heat."  
**341J** Edwin L. Wiegand Co.

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**83** Surface Combustion Corp.

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**341K** Isopad Ltd.

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**341M** Cleaver-Brooks Co.

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**342O** V. D. Anderson Co.

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**342P** W. H. Nicholson & Co.

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**23a** Yarnall-Waring Co.

**Traps, Steam.** . . . . New bulletin gives description of inverted bucket traps known for trouble-free, longer life, since bucket is guided on patented center tube. Prevents damage to bucket, valve & seat. Bulletin 154.  
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**342R** Armstrong Mach. Wks.

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**342W** American Brass Co.

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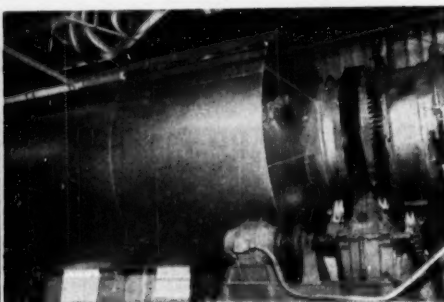
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343B Republic Steel Corp.

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343C Babcock & Wilcox Co.

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343F E. I. du Pont de Nemours.

**Bag Closing Machines.....**Information emphasizing importance of speed and economy in closing small paper bags. Brochure describes and illustrates equipment designed for these operations. Bulletin No. 100.  
343G Union Special Mach. Co.

**Bag Closing Machines.....**Better protection faster packaging at lower cost. Close open-mouth, multiwall paper bags semi-automatically. Capacity for taping & sewing 15 bags a minute. Complete data.  
343H International Paper Co.

**Bag Closing Machines.....**Description of product line with illustrations and data charts. Machines are built to meet heavy production schedules at lower cost. Strong closures for dependability. Bulletin No. 200.  
343I Union Special Mach. Co.

**Bag Manufacture.....**Features equipment for increasing efficiency and lowering unit costs in seaming and hemming operations. Also constructions used in making cloth, paper & mesh bags. Illustrated Bulletin 262.  
343J Union Special Mach. Co.

**Belting, Conveyor, Rubber.....**Describes various types of conveyor belting and their usage. Feature superior performance and low operating costs. Specifications included in illustrated folder, "Belting for Industry."  
343K Hamilton Rubber Mfg.

**Belting, Elevator.....**24 page illustrated engineering handbook covers types of belt bucket elevators, factors for belt selection, procedures for engineering the correct belt, and other pertinent information.  
343L B. F. Goodrich-Co.

**Belts, Conveyor.....**Hot material conveyor belts with rayon fabric reinforcement are thinner, dissipate heat more quickly, offer greater ply adhesion than cotton fabric belts. Catalog Section 2400.  
343M B. F. Goodrich Co.

**Belts, Conveyor.....**30 page catalog covers industrial rubber conveyor belting. Includes full page photographs of belting installations, in addition to technical data on belting constructions, etc.  
343N Hamilton Rubber Mfg. Corp.

**Belts, Conveyor, Woven Wire.....**Belts help provide continuous, automatic production—automation. Impervious to damage from abrasion, corrosion, heat or cold. Technical manual of belt applications offered.  
343O Cambridge Wire Cloth.

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343R Stevens-Adamson Mfg. Co.

**Carboys, Polyethylene.....**Advantages of unbreakable 6 1/2 & 18-gal. carboy. Specifications for jacketed & unjacketed carboys in tabular form. Sketches & photos show advantages for shipping & in-plant use. 8 p.  
343S Plax Corp.

**Carriers, Pivoted Bucket.....**Carriers help solve tough materials handling problems. Many circuit layouts possible—handle fragile crystals, lump or powdered materials. Details in Pivoted Bucket Bulletin CE-464.  
343T Hapman Conveyors Div.

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343U Monsanto Chem. Co.

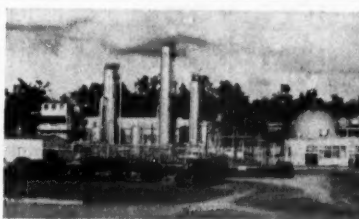
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343X Steel Shipping Container.

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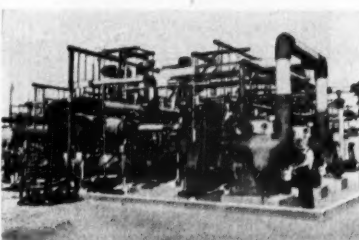
**Conveying Equipment.....**Photos, specifications and application data on line of portable and Permanent-type belt units, gravity wheel and roller conveyors, industrial casters, etc. Information in Catalog GC-53.  
343Z Rapids-Standard Co.



Several agricultural ammonia plants, like this one in Miss., use Frick equipment.

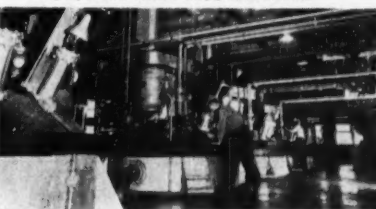


Frick solid carbon dioxide plant now under construction will make 100 tons daily.



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285 Fuller Co.

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319 J. W. Greer Co.

**Conveyors.....**New folder composed of 20 case history field reports which demonstrate factually how conveyors cut production overhead for industries which utilize them to the fullest.  
344A Speedways Conveyors.

**Conveyors.....**Literature offers information on conveying systems which feature fast, safe, clean handling of materials in small space at low cost per ton. Request descriptive Bulletin No. 140.  
344B Stephens-Adamson Mfg. Co.

**Conveyors.....**Pivoted bucket carrier under exact time, temperature & handles "problem" materials. Patented top loading device handles fragile, crystalline materials with least particle breakage.  
305b Hapman Conveyors.

**Conveyors.....**Handle packages, parts, units—faster—at reduced cost with gravity or power roller, belt, slat, chain, wheel or push-bar conveyors. Offers complete description in Bulletin 63-D.  
344C Standard Conveyor Co.

**Conveyors.....**Wide applications of power-driven conveyors for handling materials throughout industry. Reduce non-productive labor costs. These and other features in Illustrated Catalog No. 1053.  
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344E Dracoo Corp.

**Conveyors.....**Furnishes valuable data on the cost-cutting advantages of a new type multiplane bucket trolley conveyor with a patented "Stif-Arm" bucket hanger design. Details in illustrated Bulletin MT-254.  
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344F Barber-Greene Co.

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344G Barber-Greene Co.

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344H Hewitt-Robins.

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344L Hapman Conveyors Div.

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344M Gifford-Wood Co.

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344N Syntrol Co.

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344S Clark Equipment Co.

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**345B** Humphrey-Elevator Co.

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**345C** Proportioneers, Inc.

**Feeders.**.....Scale feeders and meters offer accuracy, reliability, versatility for continuous weighing of free flowing solid materials. Application data available in detailed Publication No. TA-1002-M.  
**345D** Wallace & Tiernan Co.

**Feeders.**.....36 pages describes line of equipment for processing of dry, powdered, granular, or crystalline materials. Data includes installation drawings & pictures, specifications, engineering data. Catalog 801.  
**345E** B. F. Gump Co.

**Feeders, Belt Gravimetric.**.....Push button control from central control panel for continuous compounding of dry materials. Feeders are totally enclosed, dust-tight, etc. Bulletins 35-G5 & 35-F5B.  
**345F** Omega Mach. Co.

**Feeders, Constant-Weight.**.....Data on a regulating feeder which maintains a positive constant-weight feed rate regardless of feed size or volumetric variation. Request illustrated Bulletin No. 33-D-11.  
**345G** Hardinge Co.

**Feeders, Disc.**.....For accurate and continuous feeding of dry materials at low rates. Features, advantages, operation, feed range, and other technical information included in illustrated Bulletin 50-K57.  
**345H** Omega Mach. Co.

**Feeders, Dry & Liquid.**.....Equipment package is complete solution to difficult feeding problems—feeders are adaptable to all types of feeding and proportioning requirements. Details in Bulletin BIF-K7.  
**345I** Omega Mach. Co.

**Feeders, Gravimetric.**.....Carefully designed for dry materials...offering wide feed range, low operating cost, high accuracy, large hopper capacity, dust-free operation, modern compact design, etc. Bulletin 30-K4.  
**345J** Omega Mach. Co.

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**345K** Sawyer-Bailey Corp.

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**345L** Omega Mach. Co.

**Feeders, Reagent.**.....Offers dependable, corrosion-proof feeders machined and molded from polyvinyl chloride. Offer accuracy, economy, wide feeding range. Characteristics and specifications listed in Bulletin No. 541.  
**345M** Clarkson Co.

**Feeders, Rotary Airlock.**.....For feeding or unloading pneumatic conveying systems, sealing off cyclone dust collectors, bag filters or other dust suppression equipment against air leakage. Offer technical data.  
**331a** Prater Pulverizer Co.

**Feeders, Vibrating.**.....Information on feeders that operate at near-resonant frequencies. Description of uses, specifications, capacities, dimensions, operating principles, and other details. Data Sheet 5302.  
**345N** Richardson Scale Co.

**Feeders, Volumetric.**.....Volumetric feeders of simple design and rugged construction, easily adapted to installations requiring proportional pacing by auxiliary meters. Bulletins 45-H3 & 50-K3.  
**345O** Omega Mach. Co.

**Formalin Handling.**.....Formalin Handling Manual covers unloading, storing, temperature effects, safety precautions, tankcar construction, methods of analysis, first aid, specifications, properties.  
**345P** Celanese Corp. of America.

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**345R** Yale & Towne Mfg. Co.

**Hoists.**.....Illustrations, descriptions and specifications for over 100 types and sizes of portable hoists. Includes complete details on ratchet lever hoists—discusses both roller and coil chain models. Bulletin CL.  
**345S** Coffing Hoist Co.

**Hoists, Electric.**.....Literature includes performance and safety features, cutaway drawings showing details of construction, specifications and dimensions of all 17 models from 500 to 4000-lb. capacities. Bulletin QL.  
**345T** Coffing Hoist Co.

**Hoists, Electric.**.....Description of compact, planetary gear, wire rope type hoist. Capacities from 250 to 2000 lbs. Parallel or cross mounted with bolt, hook or trolley suspension. Illustrated Bulletin 182 available.  
**345U** Shepard Niles Crane.

**Identification Marking Machines.**.....Automatic production line machines for identification marking and code-dating of packages and products. Also automatic bulk-fed and semi-automatic marking machines.  
**345V** Adolph Gottschow.

**Jacks.**.....Explains how to choose right jack for the job, lists types of ratchets, screw and hydraulic jacks—from 3 to 100 ton capacities—with full specifications for each jack. 40 p. Catalog No. 204.  
**345W** Duff-Norton Mfg. Co.

**Labels.**.....Self-sticking special markers or labels with any wording, trade mark, number, etc. in size, color, shape desired. Includes Dispenser Card. Also ordering instructions, prices, etc. Bulletin 132.  
**345X** W. H. Brady Co.

**Lifters, Drum.**.....Economical, dependable & durable for all types of lifting, stacking & loading of bulk material drums, either at plant or at construction site. Specifications and further details offered in literature.  
**345Y** Lexsuo, Inc.

**Loaders.**.....1½ yard loaders offer sure-footed four-wheel drive traction and patented "bucket rocking action" in addition to other built in exclusive features. Illustrated Bulletin available upon request.  
**345Z** Le Roi Co.

**Magnet Selector Charts.**.....Charts to aid in selecting most efficient plate magnets to separate tramp iron from materials conveyed in chutes. Face of chart contains diagrams and tables with explanatory captions.  
**345AA** Eriez Mfg. Co.

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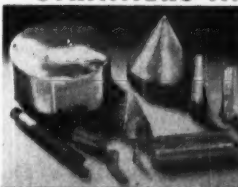
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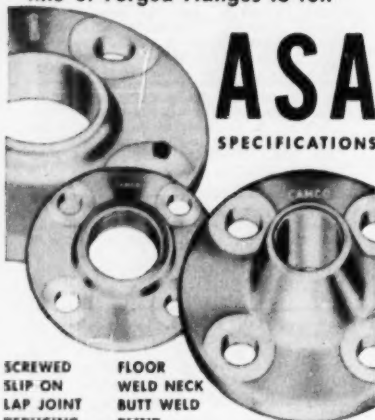


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## TECHNICAL LITERATURE

**Magnets . . . . .** These powerful, non-electric magnets stop iron in the hump, chutes or ducts. Magnetic strength guaranteed forever. Complete information on Ferma-Plate magnets in Catalog C-1205-B.  
**346A** Dings Magnetic Separator.

**Magnets . . . . .** Describes the line of electric and non-electric magnets for installation in, on or above material conveying systems and integration with processing machinery. Full details in Catalog C-5000-B.  
**346B** Dings Magnetic Separator.

**Magnets . . . . .** Company's drum-type magnetic spout separator helps eliminate tramp iron hazards. Removes destructive bolts, nails, tacks, etc.—continuously and automatically. Bulletin No. 93-E.  
**346C** Stearns Magnetic.

**Magnets . . . . .** Help protect costly machinery against destructive forces of tramp iron. Describes single gap, double gap, heavy duty and hump chute magnets in illustrated brochure now available.  
**331e** Prater Pulverizer Co.

**Magnets . . . . .** These powerful, tramp iron magnets can be suspended over conveyor belts, may be installed on chutes or liquid lines. Full range of sizes and magnetic strengths. Catalog No. 1315-A.  
**346D** Dings Magnetic Separator

**Magnets, Spout . . . . .** For plant safety and product purification . . . reduce explosion, fire and equipment damage, cut insurance rates with electro or permanent spout magnet. Bulletins No. 92F and 97E.  
**346E** Stearns Magnetic.

**Materials Handling . . . . .** Shows how new and revolutionary units are used to work-position, dump, store, collect and transfer variety of materials and scrap. Details available in illustrated Booklet MH-811.  
**346F** Union Metal Mfg. Co.

**Materials Handling . . . . .** Makes available a new, 28 page illustrated reference, "The Turner System of Materials Handling," which offers valuable ideas for savings in labor, space and equipment.  
**346G** Factory Service Co.

**Materials Handling . . . . .** 32 page company Brochure offers description in brief, case history fashion of a broad range of engineered materials handling installations in a variety of industries. Illustrated.  
**346H** Gifford-Wood Co.

**Materials Handling . . . . .** Data on new combined tractor-trailer and tow-lined order picking system for warehouses, 50 models of floor trucks, 12 types of dollies, etc. Illustrated Junior Catalog 54-C.  
**346I** Nutting Truck & Caster

**Materials Handling . . . . .** Literature graphically describes the Benchevator, a new materials handling device that speeds work on anything handled in stacks or sheets . . . in Bulletin No. 14.  
**346J** Rodney Hunt Mach. Co.

**Materials Handling . . . . .** Integral-type Motocylinders for material handling applications. Includes operational and maintenance features plus ratings, applications, and characteristics in Booklet B-6090.  
**346K** Westinghouse Elec. Corp.

**Materials Handling, Bulk . . . . .** Tote system speeds up weighing and blending operations, automatically, accurately; reduces labor and handling costs; eliminates product loss; offers other advantages. Illustrated Bulletin.  
**346L** Tote System.

**Materials Handling, Bulk-Flo . . . . .** Equipment designed to reduce handling costs on wide range of materials. Features ability to feed, convey, elevate in one compact, fully enclosed assembly. 28 p. Book 2475.  
**346M** Link-Belt Co.

➔ **Want a copy of any of these literature items? Just write its code number on one of the postcards beginning on p. 35, then mail to us. It's that easy now.**

**Packers, Bag . . . . .** Cut packing costs—quickly fill self-closing bags to desired weight, save time in filling, eliminate need for sewing or other expensive bag closing equipment. Keep labor costs down.  
**346N** E. D. Coddington Mfg.

**Panels, Neoprene . . . . .** Solve flow stoppage problems and help reduce operating expense. Panels resistant to oils and most chemicals and are tough enough to withstand severe abrasive and corrosive service.  
**346O** Gerotor May Corp.

**Paving Breaker Tools . . . . .** Complete line of tools and accessories for paving breakers. Includes illustrations, specifications, applications, table of weights, sizes, and other technical information. Form 4126.  
**346P** Ingersoll-Rand Co.

**Paving Breakers . . . . .** Company's new descriptive literature includes features and specifications on Gardner-Denver heavy-duty, medium weight and lightweight paving breakers. Bulletin PBI.  
**346Q** Gardner-Denver Co.

**Petroleum Handling . . . . .** 79 p. with photos and dimensional cross section drawings of valves, joints, faucets, etc. Description and weights data for estimating and ordering. Engineering data tables. Catalog 61.  
**346R** Wheaton Brass Wks.

**Phenol Handling . . . . .** 32 page booklet describes complete information on unloading tank cars, unloading small containers, sampling, transfer, ring, storing, etc. Fully illustrated. "The Safe Handling of Phenol."  
**346S** Monsanto Chem. Co.

**Phthalic Anhydride . . . . .** Manufacturer's Chemical Department offers booklet which covers important data on phthalic anhydride. Full information in detailed "Aero Phthalic Anhydride. Properties and Methods of Handling."  
**346T** American Cyanamid Co.

**Pipe Layers . . . . .** Constructed to lift, carry and place heavy, unwieldy line pipe. Mounted on tractors and feature economy and ability to work in tough terrain. Illustrated Form No. D377 furnishes details.  
**346U** Caterpillar Tractor Co.

**Pulleys, Magnetic . . . . .** Magnetic pulleys protect equipment in a coal preparation plant against bolts, spikes, cutter bits and other stray iron. Details offered in Bulletin No. C-5000-B upon request.  
**346V** Dings Magnetic Separator.

**Pulleys, Magnetic . . . . .** For tramp iron removal. Design and position of magnets provide a uniform, powerful pulling force. Operate anywhere with no current required. Company provides data in Bulletin 350C-1.  
**346W** Stearns Magnetic.

**Ramps, Loading . . . . .** Covers the full company line of hydraulic adjustable loading ramps. Includes design and construction features, engineering diagrams and application data in illustrated brochure.  
**346X** Rowe Methods.

**Ramps, Dock . . . . .** Literature gives complete data on non-floating 10,000 lb.-capacity hydraulic adjustable ramp designed as a bridge between dock loading platforms and the beds of highway trucks.  
**346Y** Rowe Methods.

**Ramps, Dock.**.....Describes manual floating, 20,000-lb-capacity hydraulic adjustable dock ramps, specifically designed to bridge loading platforms with highway truck beds. Details available in illustrated Bulletin.  
347A Rowe Methods.

**Ramps, Magnesium.**.....Provides detailed literature which describes and illustrates new improved, modernized design features of magnesium ramps for car loading, truck loading and yard loading operations.  
347B Penco Engrg. Co.

**Scales.**.....Describes full range of models from bench scales to heavy duty motor truck scales. One piece sectors featured in new full floating, double pendulum mechanism. Cites advantages. Form No. 2001.  
347C Toledo Scale Co.

**Scales, Automatic Barging.**.....Complete information on new automatic scales for barging fertilizer. Covers operation, materials of construction, data on accuracies, capacities, etc. Illustrated Bulletin No. 0552.  
347D Richardson Scales Co.

**Scales, Automatic Filling.**.....Covers automatic net weight and gross weight filling scales especially built for production weighing of either granular, flake, pellet or fibrous materials. Descriptive Bulletins.  
347E Thayer Scale & Engrg.

**Scales, Pneumatic Weighing.**.....New Platform scales adaptable for batch weighing or continuous process control. Literature gives information on features, specifications, accessories, operation, etc. Catalog No. 10.  
347F Weighing Components.

**Scissors, Power, Automatic.**.....Equipment designed for safe, speedy, 1 man operation in unloading bulk material from box cars. Lists information on outstanding features, dimensions and specifications in Bulletin 863.  
347G Jeffrey Mfg. Co.

**Scrapers, Folding.**.....Information on heavy-duty high capacity scrapers. Folding feature makes scraper require less power on return pull and allows it to dig in for full load on every trip. Bulletin C3004.  
347H Elmcro Corp.

**Separators, Magnetic.**.....Cross-sections with dimension & capacity tables to aid in selection. Details of Ferro Filter method of magnetic separation. Equipment in 3 types—gravity, pipeline, underfeed. Bulletin 18.  
347I S. G. Frantz Co.

**Separators, Magnetic.**.....Combines automatic alarm system with permanent magnetic separator. Protects against machinery damage, fires, product contamination by tramp iron. Details in Magnalarm Bulletin.  
89 Eriex Mfg. Co.

**Shelters, Loading Dock.**.....Company offers 20 page illustrated booklet "Your Guide To Important Facts About Loading Dock Shelters & Canvas Wall Curtains." Covers various types of each product and their use.  
347J Atlas Industries.

**Silos & Storage Systems.**.....Concrete silos and storage systems meet needs of diversified industries. Improve handling facilities, help build reserves, lower operating costs, and present other advantages.  
347K Marietta Concrete Corp.

**Slings, Woven Wire.**.....Feature safety, flexibility, strength and low maintenance in materials handling. Typical applications, sling fabrics, engineering data, prices, etc. contained in booklet.  
347L Cambridge Wire Cloth Co.

**Spaders, Clay.**.....Describes and gives the specifications for Gardner-Denver clay spaders, trench diggers, and single pad and triplex backfill tamppers, in new, valuable company Bulletin No. ST-100.  
347M Gardner-Denver Co.

**Storage & Reclaiming.**.....Offers practical solutions to problems involving the storing of phosphate rock and concentrates at different points and then reclaiming the same material for processing. Catalog 852.  
347N Jeffrey Mfg. Co.

**Storage Vessels, Water.**.....Graphically describes all types of water storage vessels and several installations of purification and filtration plants, in fully detailed and illustrated 20 page Catalog No. H20.  
347O Hammond Iron Wks.

**Sweepers, Magnetic.**.....Bulletin offers data on permanent magnetic Super Sweepers. Remove dangerous tramp iron from floors, parking lots, warehouses, etc. Four sizes in three magnetic strengths.  
347P Eriex Mfg. Co.

**Tank Car Classifications.**.....Reference tells at a glance which tank car to use for any given lading. Also contains blueprints and latest ICC regulations as they relate to tank usage. Completely detailed.  
347Q A.C.F. Industries.

**Tank Cars, Welded.**.....Illustrated booklet includes photographs and specifications of standard types for gasoline, liquid caustic soda, sulphuric acid and many other products in the company line.  
347R A.C.F. Industries.

**Tanks.**.....Feature tanks that are correct in design, detail and permanently leak-proof at the welded or riveted joints. Data on gas storage tanks, acid tanks, dye vats, and other similar types of equipment.  
347S R. D. Cole Mfg. Co.

**Tanks.**.....Offers stainless steel tanks for your processing—maintain stock or fabricate to special designs for your particular need. Fabricated in any size—any capacity up to 3000 gallons.  
347T Filpaco Industries.

**Tanks.**.....Strong, lightweight resin-bonded glass laminate tanks are molded in one piece. One-piece construction makes for greater durability. Company line of tanks available in 269 standard sizes.  
347U Chemical Corp.

**Tanks.**.....Feature superior quality... for longer service life, for lower maintenance, for vital extra safety. Tanks are thoroughly X-ray inspected and stress relieved. Furnishes descriptive literature.  
347V A.C.F. Industries.

**Tractor-Loaders.**.....Company line of tractor-loaders features the numerous advantages of loading with the combination of clutch-torque transmission and hydraulic torque converter. Makes available details.  
347W Tractomotive Corp.

**Tractor-Shovels.**.....Feature superior bucket action...also handle bigger loads, move more yardage—faster, at considerably lower cost. Various specifications and action photographs in informative Fact-Folio.  
347X Clark Equipment Co.

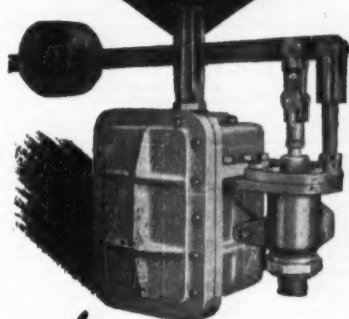
**Tractor-Shovels.**.....Feature many advantages as materials handlers... prime movers... maintenance & construction machines. Catalog covers use of tractors in modern materials handling as well as advantages.  
347Y Allis-Chalmers Mfg. Co.

**Tractor-Shovels.**.....Tells how & where to look for signs of inefficient bulk materials handling...how to analyze, organize & set up an efficient handling system. Many useful tables. "Bulk Materials Handbook."  
347Z Frank G. Hough Co.

**Tractor-Shovels.**.....Improve output & simplify material-handling problems. Valuable information in authorized Job Studies available—illustrating & describing operations in several different plants.  
347AA Frank G. Hough Co.

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SOLENOID  
VALVES



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WHEN you want solenoid valves to handle the tough jobs and give years of service, you can't get better than Davis. They give you positive, fast-action control and save money on maintenance and downtime.

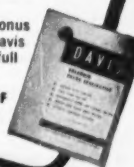
Davis builds a complete line of solenoid valves for such jobs as: controlling cylinders, vacuum breakers, shut-offs; for heating systems, liquid level control, refrigeration, cooling water control, and many other uses. No matter what your problem is, there's a Davis valve to meet the need. Write today for recommendations!

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**Davis**  
DAVIS REGULATOR COMPANY

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**Tractor-Shovels**.....16 p. on 4-wheel drive, 1½ cu. yd. tractor-shovel. Contains action views of machine doing earth & material handling jobs & pictures & detailed specifications of all 7 sizes. Form No. 255.  
348A Frank G. Hough Co.

**Tractors**.....New 8 p. illustrated booklet, "Your Job, Your Equipment and Caterpillar Service," depicts service facilities of Caterpillar dealers across the country. Includes photographs of equipment and tools. Form No. D410.  
348B Caterpillar Tractor Co.

**Tractors**.....Valuable reference describes new oil type clutch and 45 other operating details. Feature balanced design & easy steering. Cut-away illustration and specification sheet found in Form No. 30937.  
348C Caterpillar Tractor Co.

**Tractors**.....Informative photos & model cutaways of basic components included in 32 p. Shows what goes into making up each component. Also specification sheet & attachment list. Form No. 30379.  
348D Caterpillar Tractor Co.

**Tractors**.....36 p. fully illustrated catalog presents data on complete line of industrial equipment. Includes tractors, motor graders, motor wagons, motor scrapers, etc. Form No. MS-450-5310.  
348E Allis-Chalmers Mfg. Co.

**Tractors, Towing**.....Tractors offer greater ease of control, convenience & usefulness without sacrificing basic features. Details on tractors for airports, plants, yards & docks. Explained in TC-60 literature.  
348F Frank G. Hough Co.

**Traps, Magnetic**.....Permanent non-electric magnetic traps designed for economical, efficient protection against passage of tramp iron thru pipelines carrying liquids & semi-solids. Detailed Bulletin offered.  
348G Eriez Mfg. Co.

**Truck Attachments, Fork**.....Perform 2 separate functions—handle equipment in cardboard cartons & equipment in wirebound crates. Quickly detachable & can handle crates or cartons up to 1500 lbs.  
348H Lewis-Shepard Products.

**Trucks, Crane**.....Engineering drawings, detailed specifications, application photos. Operating & construction features. Electric powered truck has 4-wheel steer with length 133" & width 63". CX-4 Brochure.  
348I Elwell-Parker Elec. Co.

**Trucks, Die Handling**.....Handle dies weighing up to 1½ tons. Electric, rider type, narrow aisle trucks for metal working shops. Also includes installation photographs, specifications, dimensions. Bulletin 723-Z.  
348J Raymond Corp.

**Trucks, Electric**.....Equipment offers new platform lift with push button control. Simplifies & speeds up lighting fixture maintenance & other overhead work. Description & specifications. "Lift-A-Loft" bulletin.  
348K Barrett-Cravens Co.

**Trucks, Floor**.....Industrial & Institutional. Pocket-size booklet illustrates 32 different types of trucks for easier and safer materials handling. Specifications, descriptions, standard sizes, etc. Offers booklet 53-S.  
348L Nutting Truck & Caster.

**Trucks, Floor**.....Company presents a new, fully illustrated Bulletin featuring Tow-Line Systems for cost-saving, "production line" materials handling in warehouses & freight terminals. No. 54-TL.  
348M Nutting Truck & Caster.

**Trucks, Fork**.....Literature contains comparative data and specifications on gasoline, diesel and liquid petroleum gas powered fork lift trucks. Capacities from 1000 to 10,000 lbs. Offers Bulletin 5101B.  
348N Yale & Towne Mfg. Co.

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**Trucks, Fork**.....Offers illustrated 16 p. bulletin depicting advantages of palletized handling. Includes specifications and dimensional drawings on the eight Palletier models. May be obtained by request.  
348O Barrett-Cravens Co.

**Trucks, Fork**.....Company line of electric powered, 10,000 lb. capacity trucks offer dependable & economical operation under severest operating conditions. Full details given in illustrated Folder on Model F-39T10.  
348P Elwell-Parker Elec. Co.

**Trucks, Fork**.....Typical applications, specifications, operating & construction features, etc. 6000-lb. model with front wheel drive & rear wheel steer. Photos & drawings in Type F-31T Folder.  
348Q Elwell-Parker Elec. Co.

**Trucks, Fork**.....Folder offers detailed information on battery powered 2000 pound capacity fork trucks which are designed for fast tiering and available in two models. Details in F-26T Folder.  
348R Elwell-Parker Elec. Co.

**Trucks, Fork**.....Electric powered, handling loads in confined areas at maximum speed. Compact & maneuverable. Applications, components, engineering drawings, etc. in 4 p. "Cargo Scout" brochure.  
348S Elwell-Parker Elec. Co.

**Trucks, Fork**.....Battery powered trucks offer compactness, high capacity-to-weight ratio, full free lift, dependable performance, low maintenance. 2000-lb. capacity. Proof Folders & Comparison Charts.  
348T Lewis-Shepard Products.

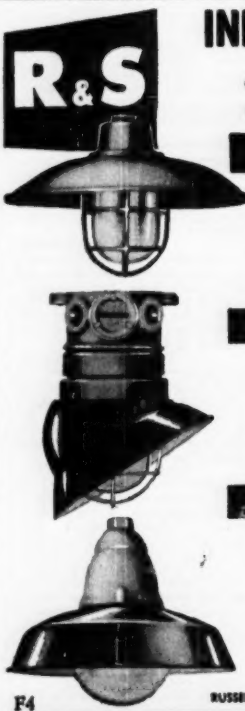
**Trucks, Fork**.....Loads trailed easier with more speed & better maneuverability. Handles loads up to 3500 lbs. Hydraulic clamping attachment can be used for handling without pallets. Details in Atlas Clamp folder.  
348U Lewis-Shepard Products.

**Trucks, Fork**.....New 16 p., completely illustrated Brochure presents a thorough description of electric work truck line. Includes pertinent information on operation and construction features.  
348V Clark Equipment Co.

**Trucks, Fork Lift**.....Informative Brochure reveals findings of survey at plant of Hudson Motor Car Co. Shows vital role played by fork lift trucks in feeding materials to assembly line. Illustrated Job Study No. 129.  
348W Towmotor Corp.

**Trucks, Lift**.....Advantages of high lift platform trucks. Elevated platform heights up to 123 inches. Capacities of 3000 & 4000 lbs. Specifications & dimensions. Bulletin No. P1512B available.  
348X Yale & Towne Mfg. Co.

**Trucks, Lift**.....Describes operation, preventive maintenance, safety & basic materials handling. Drawings for setting up obstacle course included. For beginner & experienced operator. "How to operate a Lift Truck."  
348Y Hyster Co.



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CLASS I, GROUPS C & D

For greater safety in hazardous locations wherever flammable materials are made or used. A complete line is available in pendant, ceiling, bracket and hand types—from 100 Watts through 500 Watt sizes. Standard conduit bases permit interchangeability of reflector globe assemblies.

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For hazardous locations where flammable or explosive dusts are present. Streamlined design prevents dangerous accumulation of dust particles. Two exclusive design features facilitate easy cleaning and relamping. Standard pendant and junction box bases accommodate any style of fixture—globe—assembly interchangeably in either 100 Watt or 200 Watt sizes.

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# RUSSELL & STOLL

For Inquiry Code Numbers, see Master Index on Page 6

**Trucks, Lift**.....4000-pound capacity models feature trunnion-mounted steering and pneumatic tires. Illustrated company literature includes description, typical specifications and on-the-job photos. Form 1284.

349A Hyster Co.

**Trucks, Lift**.....Offer superior operating and engineering features—exceptional stability and maneuverability speed up handling of tough capacity loads. All pertinent details contained in Booklet No. 1287.

349B Hyster Co.

**Trucks Pallet**.....Particularly designed to perform with ease for both light as well as heavy loads. Lift of 5" is accomplished with smooth functioning, fast acting hydraulic pump. Illustrated Brochure.

349C Paliton Inc.

**Trucks, Skid**.....Installation photographs, specifications & dimensions. Describes a rider type, narrow aisle, electric powered truck for the handling of semi-live skids in narrow congested areas. Bulletin 718-X.

349D Raymond Corp.

**Trucks, 2-Wheel & Platform**.....32 p. with structural details, specifications and complete data on over 50 models, including two-wheel hand trucks, steel-framed platform trucks, wagon trucks, etc. Catalog T-54 offered.

349E Fairbanks Co.

**Tube Systems, Pneumatic**.....Tube systems provide swift, sure, safe transportation of messages, documents, blueprints, samples, small parts, money, etc. Complete information included in Bulletin SPT11.

349F Standard Conveyor Co.

**Unloaders, Car**.....Makes available useful literature showing how one man is able to move three tons of material in sixty seconds with a B-G car unloader. Illustrated Folder prepared by manufacturer.

349G Barber-Greene Co.

**Vibrating Equipment**.....Literature on company line of feeders, dryers, packers, conveyors, coolers, screens. Types and sizes to meet requirements in continuous processing—at low over-all cost.

349H Jeffrey-Traylor Div.

**Vibrators**.....Manufacturer's literature release announces a complete line of quiet, powerful electric vibrators to move, settle and package stubborn materials. Information in illustrated Catalog No. 10.

349I Cleveland Vibrator Co.

**Vibrators**.....Electric motor driven rotary external vibrator with new mounting clamp. Rugged, effective & simple to use. Operation, installation, typical applications, various specifications, etc. included in catalogue.

349J Viber Co.

**Vibrators**.....Installation of the company line of vibrators for smoother, more efficient materials handling for granular or powdered chemical materials. Makes available descriptive literature.

349K Cleveland Vibrator Co.

**Vibrators, Pneumatic**.....Operating photos show industry-wide usage. Line includes 29 mountings & 14 piston diameter sizes, capable of producing a wide range of vibration intensities. Price list. 16 p. Catalog 109.

349L Cleveland Vibrator Co.

**Winches, Oil Well Servicing**.....Specially adaptable for mounting on Caterpillar tractors. Specifically designed for servicing shallow oil & gas wells. Heavy duty or high speed gearing available by changing gears in field.

349M Hyster Co.

## Safety Equipment

**Alarms, High/Low Flow**.....Meet need for high accuracy-high sensitivity alarm device for rotameters, manometers and similar process instruments. Full information in illustrated Bulletin 165.

349N Brooks Rotameter Co.

**Alarms, Smoke**.....For coal, oil, gas burning installations. Offer many features: instant warning of illegal smoke; remote bell; low cost & easy installation; frequent cleaning of units eliminated; etc. Bulletin 110.

349O Standard Instrument Corp.

**Apparel, Safety**.....Benefits of acid and caustic resistant industrial apparel of Du Pont Orion and Union Carbide's Dynel. Outwears cotton or wool, launders quickly and needs no ironing. Illustrated. 16 p.

332 Worklon, Inc.

**Clothing, Protective**.....Fact Sheet offered by manufacturer describes four superior features of heavy duty work gloves: wing thumb; reinforcing welt; as well as continuous palm; heavy-weight leather. Illustrated.

349P American Optical Co.

**Face Guards**.....Description of face guards designed for frontal & side face protection against flying objects, abrasive particles, chemical splash. Offer comfort, balance, resistance to weather. Bulletin 0302.

349Q Mine Safety Appliances Co.

**Fire Extinguishers**.....Automatic sprinkler type fire extinguishers designed to permit quick and economical installation of fire protection directly over fire hazards. Details on operation in Bulletin SP-753.

349R Stop-Fire, Inc.

**Fire Extinguishers**.....For faster, more effective & dependable fire-stopping power. Extinguishers of all sizes—from small models to piped systems & 2000 lb. stationary units. Corrosive resistant. File B-202.

349S Ansul Chem. Co.

**Fire Extinguishers**.....Dry chemical fire extinguishers offer superior safety features of spherical valve design. Covers specifications on all units, details on brackets, various advantages etc. Bulletin RF-853.

349T Stop-Fire, Inc.

**Fire Extinguishing**.....Outlines smoke & temperature-rate-of-rise fire detection systems & automatic carbon dioxide extinguishing systems for machinery & entire rooms. Also portable fire extinguishers. Bulletin PR5.

349U Walter Kidde & Co.

**Fire Protection Foam**.....Illustrated booklet with data on the advantages of foam. Tested on petroleum or polar-solvents fires. Checked as to extinguishment time, foam volume, sealability. "Foam Fire Protection".

349V National Foam System.

**Fire Protection Systems**.....Makes available information on economical, efficient, automatic fire protection systems which safeguard property, prevent loss of life, etc. Illustrated Bulletin 2426.

349W Blaw-Knox Co.

**Fire Systems, Automatic**.....Extinguish fire, sound alarm, shut down equipment. For local application or total room flooding. Complete description of equipment & methods for protection against 590 fire hazards.

349X Randolph Labs.

**Gas Masks**.....Manufacturer provides catalogue which describes canister-type gas masks. Includes data on canister construction, canister life, methods of determining gas concentrations, etc. Bulletin No. 54.

349Y Acme Protection Equipment.

**Headgear, Safety**.....For effective, comfortable head protection in areas of overhead hazards. Completely new in design, material and method of manufacture. New descriptive bulletin available.

349Z Wilson Products.

**Industrial Vision**.....This company's industrial vision program provides for increased production as well as decreasing the number of probable accidents. Offers booklet entitled "Improved Industrial Vision."

349AA American Optical Co.

**Medicine, Industrial**.....New descriptive literature made available by company speaks of the true value of industrial medicine to management, how much it costs, what it does, and the future attainment of its full potential.

349BB Mellon Institute.

**Nozzles, Water-Fog**.....500 gpm high capacity water-fog nozzles for use on turret deluge guns, ladder pipes, etc. Quickly, effectively control large fires in buildings & flammable liquids. Provides protection for user & apparatus.

349CC Rockwood Sprinkler Co.

**Respirators**.....New interchangeable respirators which can be used for organic vapors, for dusts & organic vapors, for paint spray, for acid gases, for dusts & mists, etc. Complete facts in new Bulletin.

349DD Wilson Products.

**Respirators, Chemical Cartridge**.....Data on a single respirator which protects the wearer against toxic dusts as well as organic vapors. Also features greater wearing comfort. Bulletin 1007-4.

349EE Mine Safety Appliances Co.

**Respirators, Twin Cartridge**.....Provide safe protection for multi-respiratory hazard operation. One face mask along with seven sets of cartridges actually do the work of seven respirators. "Improved Industrial Vision."

349FF American Optical Co.

**Safety Devices**.....Company makes available informative Catalog & price list of safety devices for steam and hot water boilers and hot water tanks. Includes service recommendation chart for control selection.

349GG McDonnell & Miller.

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For Inquiry Code Numbers, see Master Index on Page 6

**Safety Equipment.**.....First aid kits feature first aid supplies of pharmaceutical quality. "Control number" shown on every unit package and kit. Bulletin 0401-2 gives details and further information.  
350A Mine Safety Appliances Co.

**Safety Equipment.**.....64 p. with descriptions of many and varied types & sizes. Includes safety glasses, welding helmets, face shields, masks, hoods, aprons, sleeves, face shields, etc. Illustrated Catalog 27.  
350B Chicago Eye Shield.

**Safety Heads.**.....Protect against overpressure in any pressured systems containing air gas or liquid. Used in oil & gas producing fields, pipe lines, refineries, etc. as primary or secondary relief devices.  
350C Black, Sivalis & Bryson.

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350D Surety Rubber Co.

**Sprinklers, Spray Automatic.**.....Extinguish more fire with less water, permit wider spacing of sprinklers—and fewer heads means lower installation cost. Available in either upright or pendant style. Bulletin 70.  
350E Automatic Sprinkler Corp.

**Towers, Foam.**.....Portable, compact with hydraulic action for tank protection. Quick change unit assures safe fire blanketing foam. Uses minimum of manpower. Details covered in Data sheet 653-3-A.  
350F National Foam System.

## Processes, Services, Misc.

**Air Pollution.**.....Air pollution control treated in 3 time phases—past, present future. History of coal smoke abatement, fuel smoke & fuel dust, trends in domestic fuel, etc. Progress in Air Pollution control. 10.  
350G Mellon Institute.

**Air Pollution Control.**.....Determination of haze & smoke concentrations by filter paper samplers. Methods for sample evaluation, optical density, size of air samples, etc. Selection of graphs & photos also included.  
350H Mellon Institute.

**Ammonia Process.**.....Yield and cost advantages, principal operating features, and economics of a unique process design for ammonia plants are outlined in 8 p. illustrated booklet prepared by manufacturer.  
350I M. W. Kellogg Co.

**Ammonia Synthesis.**.....Advantages of Texaco partial oxidation process, Foster Wheeler Improved liquid nitrogen wash system, & Casale ammonia synthesis process... in combination. 16 p. Bulletin 0-54-1.  
35b Foster Wheeler Corp.

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350K Buffalo Electro-Chem. Co.

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350L American Zinc Institute.

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350M F. H. Maloney Co.

**Cathodic Protection.**.....1954 illustrated 52 p. catalog and price list released by manufacturer, covers over 700 individual items used by the corrosion engineer. Includes useful technical data. Catalog No. 54 offered.  
350N Cathodic Protection Serv.

**Cathodic Protection.**.....Data on the process of cold galvanization by brush, spray or dip method. Also includes fields of application, methods of application, many and varied advantages and typical specifications.  
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350T Battelle Memorial Inst.

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350U Walter Kilde Constructors.

**Engineering & Construction.**.....Photos & descriptive material cover gasoline plants, refineries, petrochemical process plants, catalytic cracking units & compressor stations. Application in petroleum field. 24 p. Catalog RC8523.  
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350X Dicalite Div.

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350Y Dicalite Div.

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350Z Filpaco Industries.

**Filter Media.**.....Useful data on pure porous Kel-F, a new filtration medium fully resistant to all strong acids, caustics, oxidizing agents & common organic solvents, now available on request in Brochure T-193.  
350AA Porous Plastic Filter Co.

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350BB Illinois Inst. of Tech.

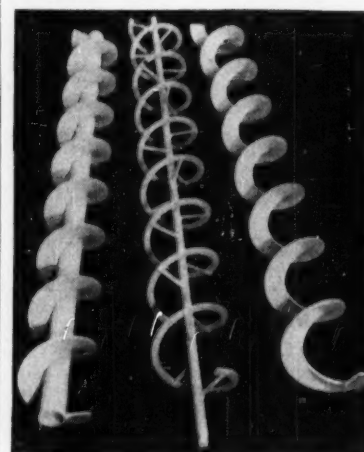
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350CC Foster D. Snell.

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351A Layne & Bowler.

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351B Mellon Institute.

**Laboratory Equipment.**.....Data on fume hoods, storage cabinets, center and wall tables, etc. Presentation of facilities & reasons why company is able to make immediate deliveries. Catalog SD2.  
351C Metalab Equipment Corp.

**Laboratory Equipment.**.....New "Mini-Lab" Brochure provides information on custom-engineered assemblies and components for small-scale laboratory work. Feature important savings in time—materials—money.  
299 Ace Glass.

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351D Metalab Equipment Corp.

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351E Arthur S. La Pine & Co.

**Laboratory Equipment.**.....24 p. illustrated brochure, "What's New for the Laboratory," offers valuable descriptive information on a new balance, colorimeter, constant-temperature circulator, etc.  
351F Scientific Glass Apparatus.



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CHEMICAL ENGINEERING—Inventory Issue 1954

**Laboratory Glassware.**.....Illustrated, 200 p. on Pyrex & Vycor brands laboratory ware, Pyrex brand fritted ware, Corning brand alkali resistant (born-free) ware, etc. Full information in Catalog LP34.  
351G Corning Glass Wks.

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351H Labline, Inc.

**Laboratory Planning Kits.**.....Particularly designed for simplified modular planning. Includes plastic guide rule & template corresponding to 1" to 1 ft. scale, with rectangular cutouts representing various base units.  
351I Metalab Equipment Corp.

**Laboratory Services.**.....20 p. on services for industrial chemicals, specialty additives, textile dyes & food-grade anti-oxidants. Various tests & products analyzed. In 7 sections. "Eastman Service."  
351J Eastman Chem. Products.

**Laboratory Ware.**.....Offers many properties important to development experimental or analytical work. Chemically stable, stands temperature to 1900° C., and easy to clean. Bulletin No. 793.  
351K Norton Co.

**Latches, Nylon.**.....For cabinets, cupboards & drawers of other uses. Offer many features: keep warped doors closed; virtually unbreakable; noiseless... no springs; adjustable tension; etc.  
351L Laboratory Equipment Corp.

**Locomotives.**.....Describes 70-ton, 600 hp locomotive. Covers over-all locomotive performance, power plant, electric drive, equalized swivel trucks, etc. Company has prepared illustrated Bulletin GEA-4657B.  
351M General Elec. Co.

**Lubrication, Centralized.**.....Centralized systems on lubrication result in increased production & lowered costs. Covers automatic pumping units, clearing presses, spray valves, etc. Studies in centralized lubrication.  
351N Farval Corp.

**Lubrication Equipment.**.....Descriptive information on lubrication equipment especially designed for the servicing of lubricated valves. Literature covers money-saving advantages. Catalog No. 22-170.  
351O Stewart-Warner Corp.

**Lubrication, Flour Mill.**.....Insures cleanliness and safety in flour mill lubrication. Economical, dependable method of lubricating hundreds of bearings. Simple & easy to install. Illustrated Bulletin No. 25.  
351P Farval Corp.

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351S Knight Models.

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351T Wilbur Streech Productions.

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351W Owens-Corning Fiberglass.

**Petro-Basic Production.**.....Petro-basic production... continuous & dependable. Simplify purchasing... keep inventories at a minimum without upsetting your processing timetables. Literature offered.  
351X Celanese Corp. of America.

**Petroleum Refineries & Process Units.**.....Complete plants & special equipment have been designed & built for practically every type of process currently used in petroleum refining industry. Bulletin 6-49-8.  
351A Foster Wheeler Corp.

**Photocopying Machines.**.....Print, process & dry automatically. Kit offers data on machines & folders on copying tax returns, color copying on pre-printed forms. Request Photocopy Information Kit.  
351Y American Photocopy Equip.

**Plant Location.**.....Brochure gives valuable information on raw materials, transportation, power and fuel, markets, labor, facilities, sites, community services, laws & regulations. Physical map included.  
351Z N. Y. State Dept. of Com.

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351e Foster Wheeler Corp.

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351AA Worthington Corp.

**Process Plants, Anhydrous Ammonia.**.....Modern design and complete instrumentation of Chemical's plants reduce manpower requirements, maintenance and operating costs. Full details in Bulletin A-101.  
351BB Chemical Construction.

**Processing.**.....Practical research used to find better methods of drying, evaporating & processing chemicals & food products. Company makes available useful Bulletin: "The Answers to 6993 Processing Problems."  
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**Processing Combination.**.....Savings through integration of number of different refining steps into single, continuous, centrally-controlled operation without intermediate storage. Catalog describes process.  
351DD M. W. Kellogg Co.

**Processing Plants, Fat & Oil.**.....Offers information on fat and oil processing plants for fat splitting, fatty acid straight and fractional distillation, hydrogenation, esterification, oil bodying. Bulletin ID-49-12.  
351d Foster Wheeler Corp.

**Product Research.**.....Deals with development of a new product, improvement of an established product or the method of producing it, and discovering new uses or a better raw material for it. 4 p.  
351EE Arthur D. Little.



**Reproduction Materials Charts.....**  
Kodagraph Selection Wall Charts help select reproduction material offering best results in reproducing any type of drawing or other original in any type of print-making equipment.  
352A Eastman Kodak Co.

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352B A.S.T.M.

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352C Arthur D. Little.

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352E Foster D. Snell.

**Reservoirs & Standpipes.....** Illustrates installations from 50,000-gals. to 10,000,000-gals. capacity. Also various roofs & architectural features, tables of capacities, data on foundations, etc. 24 p.  
352F Chicago Bridge & Iron Co.

**Rubber Processes.....** Includes a composite of text material on general rubber processes. Data sheets provide complete specifications on equipment for the rubber industry. Covers details of applications.  
352G J. H. Day Co.

**Separation Processes.....** 32 p. describes heavy-media plants treating variety of metallic & non-metallic ores. Includes plants currently in operation & those planned. Bibliography on heavy-media separation.  
352H American Cyanamid Co.

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352J Ford, Bacon & Davis Engrs.

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352K Labelon Tape Co.

**Telephone Systems, Business.....** Brochure gives explanation of how executives and key employees can be quickly reached anywhere in the plant or office by means of a special signaling device. Illustrated brochure.  
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352M M. W. Kellogg Co.

**Urea Process, Pechiney.....** Low cost, minimum corrosion process... features a neutral oil circulating medium for recycling of unconverted ammonia-carbon dioxide. Details made available in Bulletin No. 6-54-3.  
53c Foster Wheeler Corp.

**Water & Pollution Control.....** Presents "Water Supply and Pollution Control," informative booklet, which includes data on distribution of water, water requirements, stream pollution, procedures for pollution control, etc.  
352N Mellon Institute.

**Water Sampling.....** Factors involved in getting useful samples needed for proper control of water conditions in a power house. Which samples are important, when taken, where obtained and how they should be drawn.  
352O Allis-Chalmers Mfg. Co.

**Water, Sewage & Trade Waste Treating Equipment.....** Numerous installations of circular clarifiers are illustrated and various applications of this equipment are discussed. Bulletin AH-442.  
352P Hardinge Co.

**Water Treatment.....** Water Treatment for cooling towers. Types of cooling systems together with such problems as corrosion of metal surfaces, inorganic scaling, etc. Bulletin 28X7501A made available by company.  
352Q Allis-Chalmers Mfg. Co.

**Water Treatment Systems.....** Describes fully physical characteristics, types & sizes of this new water treatment system as well as its instrumentation, operation, applications, advantages. Bulletin 9042.  
352R Dorr Co.

**Wool Processing.....** Explanation of use of chemicals in the many wet operations required to convert animal fiber into wide variety of useful end products. Prepare, dyeing & finishing of woolen & worsted fabrics. 36 p.  
352S Antara Chem. Div.

**Woven Glass Roving.....** News Bulletin covers Rovcloth—new woven glass roving fabric, which is claimed to be among the strongest & most easily wet out of the plastic reinforcing materials.  
352T Bigelow Fiber Glass Prods.

**Zinc Concentrate Roasting.....** Data on new method of roasting concentrates for electrolytic or retort zinc production utilizing principle of fluidization. Operation & advantages of Fluosolids system. Bulletin 7501.  
352U Dorr Co.

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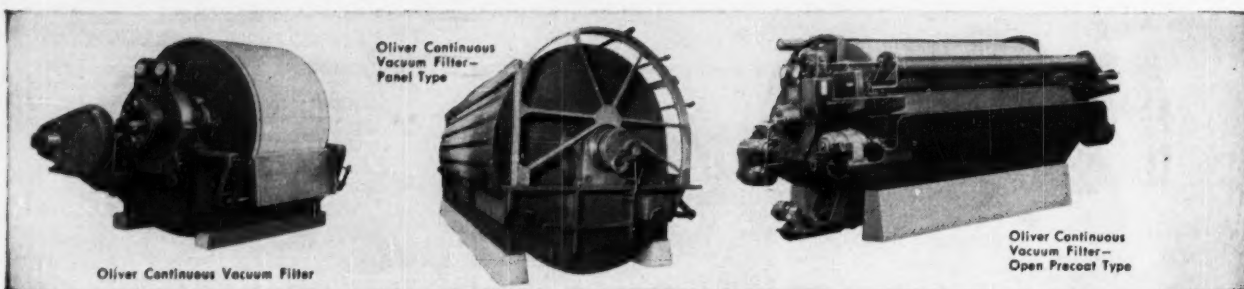
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Oliver Continuous Vacuum Filter—Open Precast Type

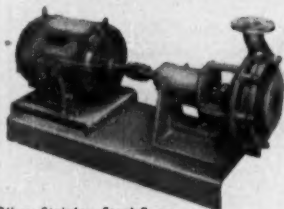
# WHY OUR FILTER TYPE SELECTIVITY PLUS OUR FILTRATION EXPERIENCE WILL SERVE

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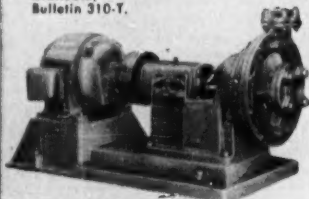
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It's because long ago wide contact with filtration problems all over the world indicated that no one filter type could possibly serve all requirements well. That same condition holds today. In the countless varieties of materials being filtered, seldom are two exactly alike. Filtration characteristics change with the size, shape and specific gravity of solids, with the pH of the solution, with its viscosity, with the dilution, with the temperature. Every change in physical, chemical, hydraulic, even ionic conditions changes the filtration characteristics.

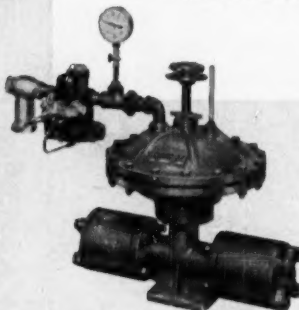
## A FEW WORDS ABOUT OUR PUMPS



Oliver Stainless Steel Pump.  
(Cast iron and bronze also available)  
Bulletin 310-T.



Olivite Acid Handling Pump.  
Bulletin 308-R2.

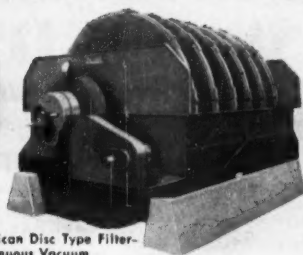


ODS Diaphragm Slurry Pump.  
Bulletin 309-R.

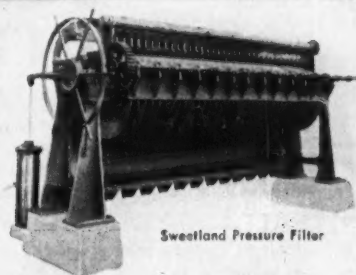
What's your pumping problem? Hot or cold chemical solution? Acid? Alkali? Slurry? In writing for Bulletins describing our pumps, tell us about your problem.



Oliver Horizontal Filter -  
Continuous Vacuum



American Disc Type Filter -  
Continuous Vacuum



Sweetland Pressure Filter

unmatched anywhere  
likewise unmatched anywhere  
**YOU BEST**

The real meaning and value of this broad Oliver United service will be clear to you. Wouldn't you be better off in selecting, not from one or two or three different types but from nearly a score of types to find the one best for your problem?

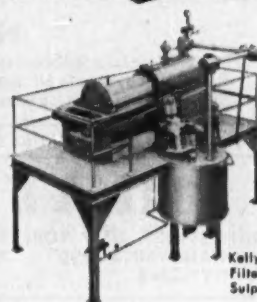
This is the type selectivity Oliver United has to offer, unmatched anywhere.

Wouldn't you also want the recommendations of engineers whose experience beginning in 1907 is as broad as it is long . . . engineers who can focus on your problem the experience developed by serving every industry on thousands of materials all over the world . . . engineers who have complete field and laboratory testing facilities with a variety of small operable filter models at their disposal?

This is the filtration experience and service Oliver United has to offer, likewise unmatched anywhere.



Kelly Pressure Filter



Kelly Pressure  
Filter -  
Sulphur Type



Oliver Continuous  
Pressure Filter -  
Precast Type

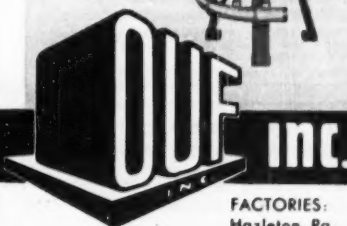


Oliver Pressure Filter

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

**OLIVER UNITED FILTERS**

NEW YORK 36 - 33 West 42nd Street • CHICAGO 1 - 221 North LaSalle Street  
OAKLAND 1 - 2900 Glascok Street • SAN FRANCISCO 11 - 260 California Street  
Export Sales Office - New York • Cable - OLIUNIFILT



FACTORIES:  
Hazleton, Pa.  
Oakland, Calif.

# PROCESS EQUIPMENT

We buy, sell, lease, liquidate and appraise individual units or complete plants.

- **BUY**—Highest cash prices paid for your good, usable equipment, or complete plant regardless of location.
- **LEASE**—Terms to suit your budget—payments applicable to purchase price if desired. Long or short term, as needed.
- **SELL**—Individual units, or complete entities at a fraction of replacement cost, for immediate shipment.
- **LIQUIDATE**—Complete plants sold for your account, either in total or piecemeal. We handle all details of dismantling, removal, advertising, invoicing, collections, and credits. Highest dollar return assured.
- **APPRAISE**—On per diem or contract basis. Includes inspection and written report acceptable for tax purposes, settlement of estates, reorganizations, etc.

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AUTOCLAVES  
BLOWERS  
BOILERS  
CENTRIFUGES  
CLASSIFIERS  
COLUMNS

COMPRESSORS  
CONDENSERS  
CONVEYORS  
DRYERS  
DUST COLLECTORS  
EVAPORATORS  
FILTERS

FLAKERS  
HAMMERMILLS  
IMPREGNATORS  
KETTLES  
KILNS—COOLERS  
MILLS  
MIXERS

PULVERIZERS  
PUMPS  
REACTORS  
SIFTERS  
STILLS  
SULPHONATORS  
TANKS

## NEW FABRICATING FACILITIES

We are in position to give you prompt shipment on all types of Processing Vessels, Tanks, Reactors, Mixers, etc., in all metals, as well as Structural Steel Buildings. We design, fabricate, erect, and install. Send us your requirements for prompt quotations.

Send for latest bulletin of equipment.

We want your surplus list. Mail it now!

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70 PINE STREET, NEW YORK 5  
Phone: HANOVER 2-4890  
TWX—NY1-2844

Machinery & Equipment Merchants

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TULSA 3, OKLA.  
Phone: 3-4890

# PROFESSIONAL SERVICES

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Consultants to the Chemical Industries  
New Products and Processes  
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Process Analysis—Market Research  
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### these SPECIALISTS

Let them save your time by bringing their broad experience in their specialty to bear on your problems.

## JAMES P. O'DONNELL

Engineers

CHEMICAL AND PETROLEUM PROCESS PLANTS  
Design—Procurement—Construction Supervision  
Start-Up  
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## J. PAUL BISHOP AND ASSOCIATES

Consulting Food and Chemical Engineers  
Specializing in:  
Designing, Estimating and Engineering of New and Modernizing of Old Food and Chemical Plants and Processes.  
Internationally Known  
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## HALE AND KULLGREN, INC.

Specialists in Process and Plants for Rubber and Plastics

A Complete Engineering Service  
including: Economic Surveys; Process Design;  
Installation; Contracting and Operation  
613 E. Tallmadge Ave. Akron 10, Ohio

## PEACOCK CORPORATION

PROPANE GAS INSTALLATIONS  
and  
ANHYDROUS AMMONIA PLANTS

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Squads furnished on a temporary basis  
ENGINEERS - DESIGNERS - DRAFTSMEN  
for revamp projects or plant modernization.  
Designers and Builders of special mechanical and process equipment.  
203 Grove St. • Westfield, N. J. • Westfield 2-7117

## KNOWLES ASSOCIATES

Chemical—Metallurgical—Mechanical Engineers

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Bowling Green 9-3456

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RESEARCH & DEVELOPMENT  
From idea through pilot plant  
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## C. L. MANTELL

Consulting Chemical Engineer

Process Research and Engineering  
Development  
457 Washington Street New York 13, N. Y.

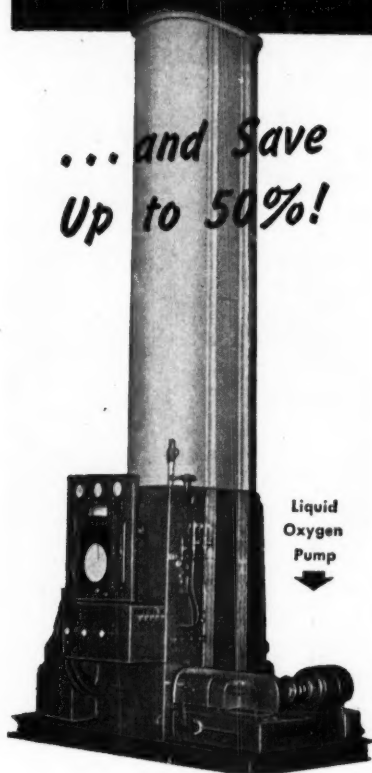
## THE J. G. WHITE ENGINEERING CORPORATION

Design - Construction - Reports - Appraisals  
80 Broad Street, New York 4



# NOW-Make Your Own Oxygen and Nitrogen in One Generator

...and Save  
Up to 50%!



With INDEPENDENT'S newly-designed generators, you can make your own high-purity oxygen and nitrogen from the free air . . . and in the same generator.

You reduce costs up to 50% by eliminating handling costs . . . vaporizing costs . . . evaporation losses . . . residual losses . . . and transportation costs.

INDEPENDENT Generators are available in any capacity, any purity and any pressure. Put your oxygen-nitrogen problem up to us . . . our engineering department will gladly submit recommendations . . . no obligation, of course!

**INDEPENDENT ENG. CO., Inc.**



Inquiry Code Number for this advertisement—357

CHEMICAL ENGINEERING—Inventory Issue 1954

## What It Contains . . .

Here is a complete, alphabetical index to all advertisers in this 1st Annual Inventory Issue.

## For More Information . . .

You can get more information on

any of the products advertised by these companies. Simply refer to the Master Index beginning on p. 6 for the code number of the specific product in which you're interested, write in this number on one of the postcards on p. 35, then mail to us. Prompt answers will be sent direct to you from the manufacturer.

## Index of Advertisers . . .

. . . To keep you in touch with what manufacturers are offering that will help you in your job.

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Atlanta 3	W. D. Lanier, 1321 Rhodes-Haverty Bldg., Walnut 5778-2823
Boston 16	W. D. Boyd, 350 Park Square Bldg., Hubbard 2-7160
Chicago 11	L. A. Cunningham, Don Gridley, J. M. Rodger, Jr., 520 N. Michigan Ave., Mohawk 4-5800
Cleveland 15	L. J. Biel, 1510 Hanna Bldg., Superior 1-7000
Dallas 1	James Cash, First National Bank Bldg., Prospect 7-5064
Detroit 26	L. J. Biel, 856 Penobscot Bldg., Woodward 2-1793
Los Angeles 17	Jos. H. Allen, 1111 Wilshire Blvd., Madison 6-4323
New York 36	R. G. Frederick, J. E. Tuohig, 330 West 42 St., Longacre 4-3000
Philadelphia 3	E. M. Schellenger, Architects Bldg., 17th & Sanson Sts., Rittenhouse 6-0670
Pittsburgh 22	G. S. Ryan, 719 Oliver Bldg., Atlantic 1-4707
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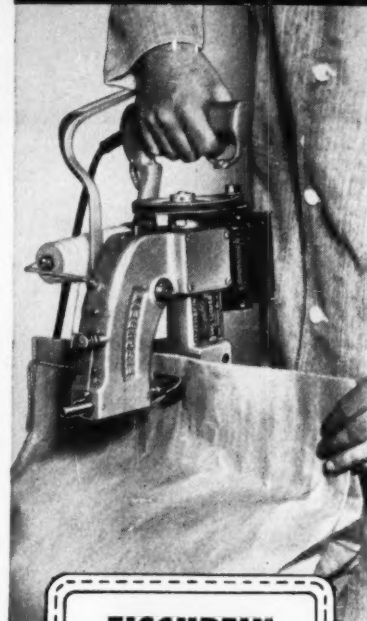
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**FOR**  
**FAST, SECURE,**  
**LOW COST**  
**BAG CLOSING**



**FISCHBEIN**  
*Portable*  
**BAG CLOSER**

- A truly portable bag closer ... Weighs only 10½ pounds.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.
- Simple to operate and maintain.
- Lowest priced bag closer on the market.

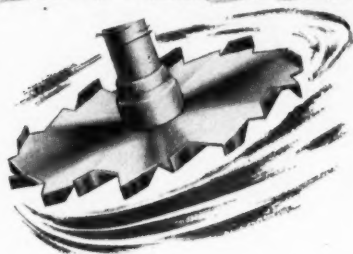
**FOR DETAILS, MAIL THIS COUPON NOW**

**DAVE FISCHBEIN CO.**  
**DEPT. 3C**  
**38 GLENWOOD AVE. N.**  
**MINNEAPOLIS, MINN.**

Name.....  
Firm Name.....  
Address.....  
City..... State.....

*Inquiry Code Number for this advertisement—358*

**Inventory Issue 1954—CHEMICAL ENGINEERING**



...at practically  
every installation

## THE Cowles DISSOLVER

That is a fact! Over 90% of the users of the Cowles Dissolver classify its performance data, with respect to their dissolving, dispensing or mixing process, as top secret. With hundreds now in use, covering applications ranging from paint to Penicillin, the Cowles Dissolver is doing a sensational job—in enforced secrecy!

### This much we can tell . . .

- Operating at rim velocities up to 7500 f.p.m. it dissolves and disperses 2 to 20 times faster, in the same working space.
- Its greater efficiency actually increases yield per batch in most reactions.
- Its capacity for complete dispersion enables many manufacturers to use less expensive raw materials.
- Use of the Cowles Dissolver often results in a better end product than originally formulated.
- Easy to load and operate, requiring practically no maintenance, it will return your original investment many times.
- Cowles will run lab tests on your material, in strictest confidence, with absolutely no obligation to you.

For complete information on the Cowles Dissolver, write for our FREE CATALOG

**The Cowles Company**  
INCORPORATED

112 Trackside, Cayuga, N. Y.

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(Classified Advertising)

H. E. Hilty, Mgr.

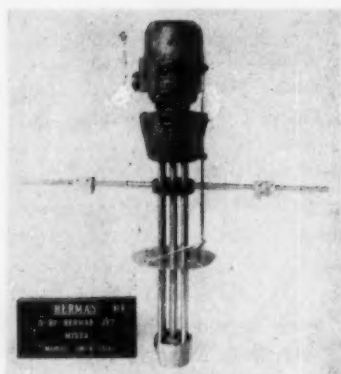
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## NEW "Jet" Mixer

- Speeds up mixing cycles
- Accelerates chemical reactions
- Emulsifies immiscible liquids
- Reduces particle size agglomeration
- Wets out solids
- Gives uniform mix without surface boil
- Circulates evenly with no vortex
- Mixes with minimum incorporation of air
- Mixes a wide range of viscosities

Write for 4-page illustrated folder.

**HERMAS MACHINE CO.**  
Hawthorne New Jersey



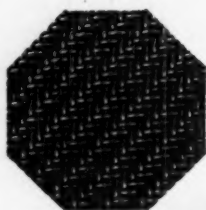
A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet."

.....

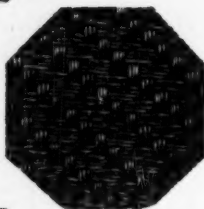
McGraw-Hill Publishing Company, Room 2710, 330 West 42nd St., New York 36, N. Y.

## Newark Metallic Filter Cloth...

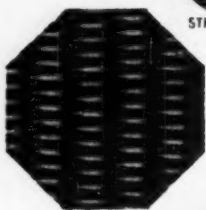
... says **STOP** to Solids



TWILL



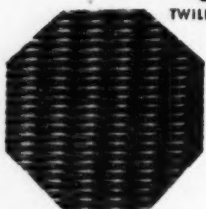
STRANDED TWILL



PLAIN DUTCH



TWILL DUTCH SINGLE



TWILL DUTCH DOUBLE

Newark Metallic Filter Cloth does stop solids — the wedge-shaped openings allow only the filtrate to pass through. And, Newark Cloth is reversible, both sides being identical. Newark Metallic Filter Cloth is woven firmly and uniformly without loose wires, guaranteeing good filtration all over.

Newark Metallic Filter Cloth is available in a variety of weaves in all malleable metals, and is adaptable to practically all types of filters. When writing, please give us details on your process.

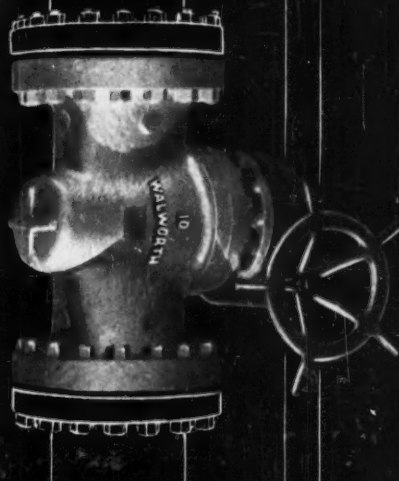
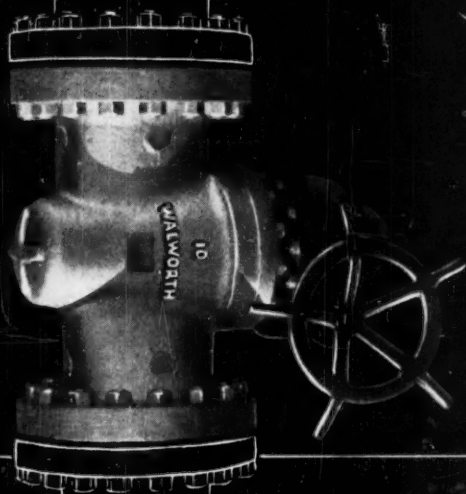
Send for our NEW Catalog E.

**NEWARK**  
for **ACCURACY**

**Newark**  
**Wire Cloth**  
**COMPANY**

351 VERONA AVENUE • NEWARK 4, NEW JERSEY

# WALWORTH



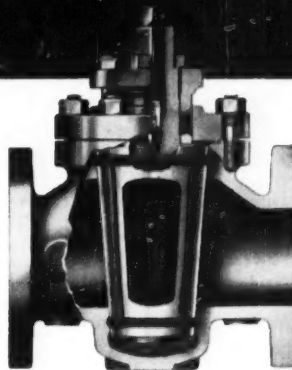
## LUBRICATED PLUG VALVES

*Better because . . .* They are pressure sealed with an insoluble lubricant readily renewed while the valve is in service. Lubricant completely surrounds the plug ports assuring a tight seal against leaks. It also insures ease of operation by reducing friction between the body and the plug while at the same time protecting the finished surfaces against corrosion and wear.

Walworth Lubricated Plug Valves are the most satisfactory valves available for the handling of gritty suspensions, and many other destructive, erosive, and corrosive industrial and chemical solutions.

They are ideal for general refinery and pipeline service.

For full information see your Walworth Distributor, or write for your copy of Bulletin 111. Walworth Company, General Offices, 60 East 42nd Street, New York 17, N. Y.



Lubricant system of a Walworth No. 1700F Regular Gland, Wrench Operated, Steel-Iron, Lubricated Plug Valve. Other Walworth Lubricated Plug Valves include Single Gland, and Ball Bearing types. Sizes to 30-inches — pressures to 5,000 psi, and for vacuum service.

# WALWORTH

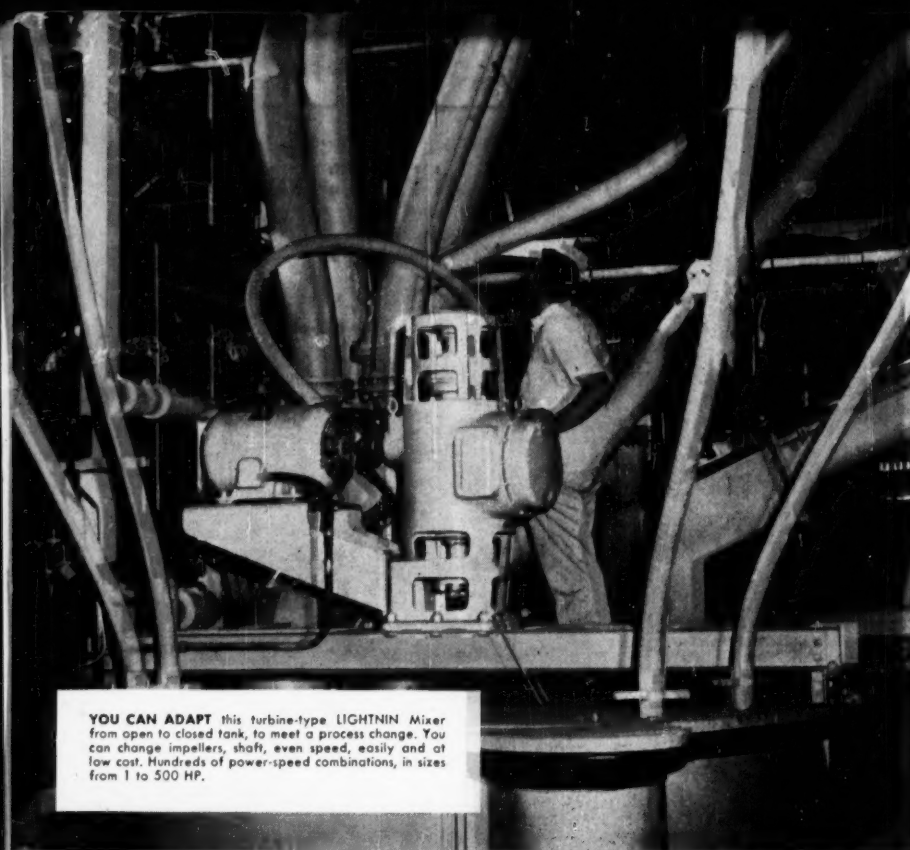
*Manufacturers since 1842*

**valves . . . pipe fittings . . . pipe wrenches**

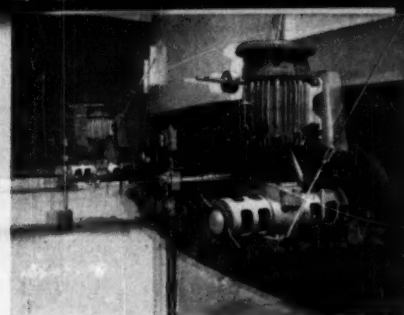
**60 East 42nd Street, New York 17, N. Y.**

**DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD**

*Inquiry Code Number for this advertisement—361*



**YOU CAN ADAPT** this turbine-type LIGHTNIN Mixer from open to closed tank, to meet a process change. You can change impellers, shaft, even speed, easily and at low cost. Hundreds of power-speed combinations, in sizes from 1 to 500 HP.



**YOU CAN CHANGE** quickly from a mechanical shaft seal to a packed stuffing box, and back again, with this LIGHTNIN Side Entering Mixer. This means easier maintenance... extra protection. Tank shutoff is out in the open—easy to get at, easy to operate. Sizes 1 to 25 HP.



**YOU CAN DO HUNDREDS** of mixing jobs quickly with versatile LIGHTNIN Portable Mixers. Instantly make any open tank an efficient mixing vessel. More than 30 standard models with electric or air motor, direct or gear drive. Sizes  $\frac{1}{2}$  to 3 HP.

Photo courtesy International Minerals & Chemical Corporation.

## Choose a fluid mixer that grows with your process

Today, this mixer is churning up 5,000 gallons of a phosphoric acid slurry.

Tomorrow, with a few simple changes, the *same mixer* may be lifting and distributing solids throughout 3,000 gallons of heavy prefill slurry.

Or it may be whirling millions of pin-point gas bubbles into intimate contact with 10,000 gallons of fermentation broth.

Provided the horsepower requirements are not too different, you can often switch a LIGHTNIN Mixer from one operation to another, at far less than the cost of a new mixer.

### 7 ways to beat obsolescence

You can change the mixer mounting from open-tank to closed pressure vessel, and vice versa. You can get a new mounting to fit any tank nozzle.

You can switch from standard to low-headroom mounting, from top entering to bottom entering.

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## Lightnin Mixers

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